CAPE FEAR TECHNICAL INSTITUTE

CATALOGUE
1968 - 1969

CAPE FEAR TECHNICAL INSTITUTE

WILMINGTON, N. C.

Catalogue of Information

1968 & 1969

General Information ..... White

Technical Division ..... Green

Trade Division ..... Yellow

Extension and General Adult Division ..... Pink

Brief Course Descriptions ..... Blue

Volume 1 November 1967

Foreword

The Cape Fear Technical Institute was founded as an area school to meet the occupational training needs of the people of Southeastern North Carolina and of the growing industrial community.

Every effort has been made to provide the equipment, facilities and skilled teachers necessary to allow maximum opportunities for the people to develop new skills, up-date old skills, and further their knowledge to enhance their value to industry and promote their own personal growth.

North Carolina has the most valuable of all resources, a vast reservoir of good people who make fine citizens and excellent employees. Therefore, Cape Fear Technical Institute pledges itself to continue to do all in its power to provide the educational opportunities needed by people to meet the challenging needs of modern industry and help them grow in their understanding and enjoyment of life.

M. J. McLEOD
President

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GENERAL INFORMATION

NOTE

The Cape Fear Technical Institute issues this catalogue for the purpose of furnishing prospective students and other interested persons with information about the institution and its programs. Announcements contained herein are subject to change without notice and may not be regarded in the nature of binding obligations on the Institute or the State. Efforts will be made to keep changes to a minimum, but changes in policy by the State Board of Education, the Department of Community Colleges, or by local conditions may make some alterations in curriculums, fees etc. necessary.

VISITORS

Visitors, and in particular prospective students, are always welcome at Cape Fear Technical Institute. The student personnel office will provide guide service for groups or individuals on week days between 8:00 a.m. and 5:00 p.m. The school is open until 10 p.m. and individuals may visit at their convenience. Questions about the school and its programs will be answered by someone from the student personnel office.

STATEMENT OF POLICY

The contact hours shown in the catalogue are minimal. It is a policy of this institution to permit students to enroll in additional subjects and laboratory work beyond those shown in the catalogue.

When in any quarter the total weekly contact hours listed are fewer than twenty-five hours in a technical curriculum and fewer than thirty hours in a vocational trade curriculum, a student may enroll on request for additional instructional hours deemed by the institution to be consistent with the program and appropriate to the student to make up twenty-five hours per week in a technical curriculum or sufficient hours of attendance to make up thirty hours per week in a vocational trade curriculum.

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CAPE FEAR TECHNICAL INSTITUTE
SCHOOL CALENDAR
1968-1969

FALL QUARTER

Registration	Tues., September 10, 1968
Classes Begin	Wed., September 11, 1968
Classes End	Tues., November 26, 1968

Total Number of Class Days: 55

Note: Thanksgiving Holidays between quarter

WINTER QUARTER

Pre-registration (students attending previous quarter only) Tues., November 26, 1968

Registration (new students and those not pre-registered) Mon., December 2, 1968

Classes Begin	Tues., December 3, 1968
Classes End	Thurs., February 27, 1969

Christmas Holidays—begin Mon., Dec. 23 thru Wed., Jan. 1, 1969

Classes resume Thurs., Jan. 2, 1969

Total Number of Class Days: 55

SPRING QUARTER

Pre-registration (students attending previous quarter only) Thurs., February 27, 1969

Registration (new students and those not pre-registered) Tues., March 4, 1969

Classes Begin	Wed., March 5, 1969
Classes End	Fri., May 23, 1969

Easter Holidays—begin Thurs., April 3 thru Mon., April 7

Classes resume Tues., April 8

Total Number of Class Days: 55

SUMMER QUARTER

Pre-registration (students attending previous quarter) Fri., May 23

Registration (new students and those not pre-registered) Tues., June 3

Classes Begin	Wed., June 4, 1969
Classes End	Wed., Aug. 20, 1969

Holiday—Friday, July 4

Total Number of Class Days: 55

STATE ADMINISTRATION

I. E. READY ..... Director, Department of Community Colleges

STATE BOARD OF EDUCATION

W. DALLAS HERRING ..... Rose Hill, Chairman
J. A. PRITCHETT ..... Windsor, Vice-Chairman
GEORGE DOUGLAS AITKEN ..... Charlotte
GARLAND GARRISS ..... Troy
R. BARTON HAYES ..... Hudson
CHARES E. JORDAN ..... Durham
WILLIAM R. LYBROOK ..... Winston-Salem
GUY B. PHILLIPS ..... Chapel Hill
JOHN M. REYNOLDS ..... Asheville
HAROLD L. TRIGG ..... Salisbury

LOCAL BOARD OF TRUSTEES

FRED J. GALEHOUSE, Chairman, 110 Green Forest Drive, Wilmington

WILLIAM EMMART, Vice-Chairman, First-Citizens Bank & Trust Co., 8 N. Front Street, Wilmington

R. L. BURNETT, New Hanover Memorial Hospital, Wilmington

L. M. CROMARTIE, 420 W. Shipyard Blvd., Wilmington

C. McD. DAVIS, Porters Neck Plantation, Route 1, Box 307-FB, Wilmington

HUBERT A. EATON, 411 N. Seventh Street, Wilmington

HOWARD HOLLY, Burgaw, N. C.

ALFRED A. JOHNSTON, Carolina Power & Light Co., Electric Building, Wilmington

THOMAS P. MAY, International Nickel Company, P. O. Box 656, Wrightsville Beach

EUGENE McWATTY, S & G Concrete Company, 2812 Monroe Street Wilmington

W. MERCER ROWE, Carolina Nitrogen Corp., Wachovia Bank Building, Wilmington

KIRBY SULLIVAN, 106 E. Moore Street, Southport, N. C.

OFFICERS OF ADMINISTRATION

M. J. McLeod	President
Clarence E. Dodgens	Director of Student Personnel
Matthew C. Donahue	Director of Technical Vocational Programs
Ralph Bordeaux	Director of Extension Programs
George W. Crowley	Director of General Adult Education
Ronald G. Mihal	Director of Evening Programs
Mrs. Elizabeth P. Carroll	Bookkeeper
Robert D. Bass	Registrar
Thomas E. Mercer	Counselor
Thomas Satterfield	Counselor

FACULTY

Ambrose, Blanche	Practical Nurse Training
Arseneault, Walter A.	Marine Technology
Averette, Roger H.	Related Studies Instructor
Batts, Chauncey W.	Mechanical Drafting
Braswell, John J.	Radio & Television
Coleman, S. Charles	Machine Trades
Coleman, William	Electronics & Instrumentation
Corbett, Mary N.	Learning Laboratory
Eckhardt, Owen S.	Chemical Technology
Ely, Jerry S.	Related Subjects Instructor
Futch, Kenneth D.	Related Subjects Instructor
Horton, Grag	Air Conditioning, Heating & Refrigeration
Ingram, Hilda, Mrs.	Operating Room Instructor
Jordan, Capt. Arthur W.	Marine Technology
Klimek, F. B.	Automotive Mechanics
Marteney, Lawrence L.	Related Subjects Instructor
Morton, Charles W.	Learning Laboratory
Motley, Joseph A.	Related Subjects Instructor
Paso, Lillian	Practical Nurse Training
Sessoms, Robert W.	Business
Sullivan, Brian T.	Marine Technology
Watters, James L.	Welding
West, Geraldine, Mrs.	Technical Secretary
Williams, Robert W.	Marine Technology
Wong, Robert	Marine Technology

AREA COORDINATORS

Dorsey, W. K.	Tourist Training
Hurst, William A.	Fishing Training

THE SCHOOL

HISTORY

The Cape Fear Technical Institute was established as the Wilmington Industrial Education Center in 1959 and was raised to the technical institute status on July 1, 1964. It is one of more than thirty such institutions operated by the State under the direction of the Department of Community Colleges in Raleigh, and is administered by a local Board of Trustees. Authority for the establishment and operation of these institutions is found in Chapter 115 A of the General Statutes of North Carolina and the amendments thereto.

PURPOSE

The purpose of the Institute is to provide trade and technical training, and general adult education for the residents of Southeastern North Carolina who plan to work in today's modern industries — to serve new and existing industries by training new employees and up-grading others. To serve the community by training employees for public agencies such as fire departments, police departments, hospitals, etc.

SHOPS & EQUIPMENT

The shops and laboratory areas were carefully planned to provide large, well-ventilated, and industrial-type training facilities.

Equipment for all shops, laboratories, test areas, drafting rooms, and for the training ship was selected to conform with the current tools and devices of industry. Students will find that ample opportunity is provided in all trade and technical curricula for skill-building practice in using modern, industrial, production and testing tools and machines. Specially planned and equipped classrooms are conveniently located for study of the academic related subjects, and a well-stocked technical library is available both day and night for use by faculty, students and area residents.

LOCATION

The Cape Fear Technical Institute is conveniently located in the heart of Wilmington on North Front Street. The campus extends from Front Street to the deep water channel of the Cape Fear River, and is bordered by Red Cross Street on the North and Walnut Street on the South. Adequate parking space is available on the campus, public transportation is nearby, and hotels, motels, restaurants, theaters, and shops are all within easy walking distance.

The four-story main building houses the administrative offices, library, laboratories, classrooms, student lounge, and part of the shop areas. An additional shop building is located at the water's edge, and a pier extends out to the deep-water channel to provide mooring for the 185-foot school ship, The SS Advance II. The buildings are of all-masonry construction, and designed especially for trade and technical programs. All classrooms and offices are air-conditioned for year-around comfort.

The Wilmington area has abundant recreational facilities. Excellent beaches, salt- and fresh-water fishing, good hunting areas; year-round golf courses and tennis courts are all located within a few minutes driving range.

QUARTER SYSTEM

The school year is divided into four quarters of 55 school days. Credits earned are in quarter hours. See course description section for number of credits required for graduation in each program.

AREAS OF STUDY

Technical Curriculums: See technical section of catalogue for descriptions.

Business Administration ..... pages 24 & 25
Chemical Technology ..... pages 26 & 27
Drafting & Design ..... pages 28 & 29
Electronics Technology ..... pages 30 & 31
Instrumentation Technology ..... pages 32 & 33
Marine Technology ..... pages 34 & 35
Secretarial-Engineering and Technical ..... pages 36 & 37

Persons graduating from these technical curriculums are awarded the Associate in Applied Science Degree.

Vocational Curriculums: See trade section of catalogue for descriptions.

Automotive Mechanics ..... pages 42 & 43
Drafting, Mechanical ..... pages 44 & 45
Heating, Refrigeration & Air-Conditioning ..... pages 46 & 47
Machinist ..... pages 48 & 49
Marine Diesel Mechanics ..... pages 50 & 51
Operating Room Technicians ..... page 52
Practical Nurse Education ..... pages 53 & 54
Radio and Television Servicing ..... pages 55 & 56
Welding ..... pages 57 & 58

A diploma is earned by graduates of these vocational programs.

ENTRANCE REQUIREMENTS

All correspondence concerning admissions should be addressed to **The Director of Admissions.**

ADMISSION OF NEW STUDENTS — The Cape Fear Technical Institute follows the "Open Door" policy established by the State Board of Education. This policy provides for the admission of any North Carolina citizen who has reached the age of 18, or whose high school class has graduated. This policy is based on the belief that the school has something to offer at all educational levels and that through effective guidance a person can find his or her place in the proper educational program.

While a high school education or its equivalent*, is desirable for admission to the full-time training programs, some exceptions are made for individuals whose age and maturity make success in a program likely.

See individual course description in this catalogue for specific admission requirements, prerequisites, etc., for each course.

ADMISSION CRITERIA

1. **Previous Education** — Each applicant shall request his or her high school to submit a transcript showing graduation. Those who are high school seniors should have their school submit a transcript showing work through the first semester of the senior year as soon as possible after the semester has ended, and a supplementary transcript showing graduation at the close of school.

Applicants who have the high school equivalency certificate* should submit a copy of the certificate, but should also ask their high school to send transcript of all work done at the school.

Transcripts of previous education in colleges, technical institutes, etc., should also be submitted to the school. **All transcripts must come directly from the school to the Technical Institute and not from the applicants themselves.**

2. **Scores on General Aptitude Test Battery** — The GATB is administered by the Employment Security Commission and measures aptitudes related to the courses of study offered by the school. Applicants may take the test at any Employment Office and request that scores be sent to the Institute. Residents of New Hanover, Brunswick and Pender Counties should obtain a slip from the School requesting the Employment Security Commission in Wilmington to administer the test. The Wilmington office is located at 717 Market Street.

*See page 62 in General Adult Education Section for details about the high school equivalency certificate.

Qualified counselors at the school use the test results in helping individuals decide which course of study to follow. There is no charge for the test, nor for the counseling services.

3. **Personal Interview** — The personal interview is beneficial to both the applicant and to school officials in that it affords an opportunity to "get acquainted." The applicant has an opportunity to ask questions about the school and its programs while school officials make an effort to evaluate the applicant's interest in, and capability to pursue the program of study applied for.

ADMISSION OF OUT-OF-STATE STUDENTS — Out-of-state students are admitted under the same regulations as others. Tuition and fees are established by the State Board of Education. The most recent ruling places these charges at two and one-half times the amount charged North Carolina students.

1. A person twenty-one years of age or older is not deemed eligible for the lower tuition rate unless he has maintained his legal residence in North Carolina for at least the six months next preceding the date of his first enrollment in an institution of higher education in this State.

2. The legal residence of a person under twenty-one years of age at the time of his first enrollment in an institution of higher education in this State is that of his parents, surviving parent, or legal guardian. In cases where parents are divorced or legally separated, the legal residence of the father will control unless custody of the minor has been awarded by court order to the mother or to a legal guardian other than a parent. No claim of residence in North Carolina based upon residence of a guardian in North Carolina will be considered if either parent is still living unless the action of the court appointing the guardian antedates the student's first enrollment in a North Carolina institution of higher education by at least twelve months.

3. The residence status of any student is determined as of the time of his first enrollment in an institution of higher education in North Carolina and may not thereafter be changed except: (a) in the case of a nonresident minor student at the time of his first enrollment whose parents have subsequently established legal residence in North Carolina; and (b) in the case of a resident who abandons his legal residence in North Carolina. In either case, the appropriate tuition rate will become effective at the beginning of the quarter or term next following the date of change of residence status.

4. The legal residence of a wife follows that of her husband, except that a woman student currently enrolled in this institution

as a resident may continue as a resident even though she may marry a nonresident.

5. Military personnel attached to military posts or reservations in North Carolina are not considered eligible for the lower tuition rate unless they have maintained a legal residence in the state for at least the six months next preceding the date of first enrollment in an institution of higher education in the State.

6. Aliens lawfully admitted to the United States for permanent residence who have established a legal residence in North Carolina according to paragraphs numbered 1, 2, or 4, above, are eligible for the lower tuition rate.

7. Ownership of property in or payment of taxes to the State of North Carolina apart from legal residence will not qualify one for the lower tuition rate.

The furnishing of incomplete or incorrect information regarding residence may result in the student's dismissal from the Institute. The Registration Office determines each student's residence status on the basis of existing information and interpretation of regulations.

ADMISSION OF TRANSFER STUDENTS — Credits earned at other educational institutions with a grade of "C" or better are accepted in transfer insofar as they apply to a particular course of study. Transcripts of all previous education must be submitted by transfer applicants.

ADMISSION OF FORMER STUDENTS — All former students who left the school in good standing are encouraged to enroll for additional study at the Institute.

REGISTRATION — Students who have been admitted, and who have paid their admission deposit (see page 16 for information on this deposit) will register on the dates set by the school for this purpose. Students will obtain their class schedules, pay their fees and purchase their books.

HOUSING — The Institute does not have housing facilities, but students have no difficulty in locating satisfactory housing quarters. Some places provide room and board at moderate rates. School officials will assist students in finding housing but cannot assume responsibility beyond this. Students and landlords should have a complete understanding with regard to rental conditions, so that there will be no misunderstanding concerning such details.

HOW MUCH DOES IT COST?

All fees are established by the State Board of Education. Currently tuition is charged at the following rates for all curriculum courses:

North Carolina Students:

Full time ..... $32.00 per quarter
Part time ..... $2.50 per quarter hour credit

Out-of-State Students:

Full time ..... $80.00 per quarter
Part time ..... $6.25 per quarter hour credit

Books and small tools are purchased by students as they are needed. Books cost on the average approximately $50.00 per year. Costs of tools vary with the course of study, but do not ordinarily exceed $20.00 for a year.

All students who work in laboratories or shops are required to purchase accident insurance; this insurance presently costs $2.00 per year.

WHEN ARE PAYMENTS MADE?

When an applicant is officially admitted to a course of study, he is required to make a $15.00 admissions deposit ($37.50 for out-of-state students). This deposit is non-refundable except in cases where the school is unable to admit the person or unable to offer the course applied for, but is applied to the first quarter's tuition charge upon registration.

All tuition charges shall be paid in full on registration day, however in hardship cases, monthly payments may be permitted. Any exceptions to rules on financial affairs must be approved by the Student Personnel Office.

The accident insurance is purchased on registration day of the first quarter of attendance.

No student will be permitted to graduate, nor will transcript be issued until all financial obligations to the school are satisfied.

ARE REFUNDS MADE?

Refunds of two-thirds the quarter's tuition may be made in cases where a student is compelled by unavoidable reasons to withdraw during the first ten (10) calendar days of any quarter. No refunds are made after the ten-day period except in cases where the student is a veteran or war orphan. Veterans or war orphans receiving benefits under U.S. Code, Title 38, Chapters 33 and 35, can be refunded the pro rata portion of the tuition fee not used up at the time of withdrawal of such students.

IS STUDENT FINANCIAL AID AVAILABLE?

Limited financial aid is available through gifts or loan funds provided by individuals or civic groups. Inquiries concerning financial aid should be addressed to the Director of Student Personnel.

1. NEW HANOVER COUNTY MEDICAL SOCIETY LOAN FUND.

   This is a revolving loan fund established by the Medical Society for students in the practical nurse training program.

2. EAST WILMINGTON ROTARY CLUB LOAN FUND.

   Loans are made to students recommended by the school. No interest is charged while student is in school.

3. WORK STUDY PLAN.

   The Institute participates in the work study program of 1963 Vocational Education Act. Students may work for the school a maximum of fifteen (15) hours per week while in school. The extent of this program is, of course, determined by the amount of funds available.

4. VOCATIONAL REHABILITATION.

   Vocational Rehabilitation is a program operated through the Division of Vocational Rehabilitation in cooperation with the North Carolina Department of Public Instruction and the Federal Office of the Vocational Rehabilitation Administration. The Division is financed by State and Federal funds. Vocational Rehabilitation offers such services as are necessary to enable a physically or mentally employment-handicapped person to become self-supporting. Financial assistance is available for training at the Cape Fear Technical Institute for eligible handicapped persons.

   If a prospective student has a physical disability or is limited in his activity because of a disability he should contact the Division of Vocational Rehabilitation office nearest him. The Division Office for Southeastern North Carolina is located in the Murchison Building in downtown Wilmington.

5. "G.I. BILL" THE VETERANS READJUSTMENT BENEFITS ACT OF 1966.

   All programs being offered by the Institute at this time are approved for training under the so-called "Cold War

G.I. Bill." Veterans desiring to train under the benefits of this bill must first establish their eligibility with the Veterans Administration. In general, Veterans who served in the Armed Forces since January 31, 1955, and who were discharged under conditions other than dishonorable, qualify for training under the bill. The amount of training permitted is determined by the number of months of service. Certain servicemen on active duty are also eligible for schooling under this bill. Interested servicemen should contact their Education Officer.

Veterans are admitted under the same admission requirements as other students. They pay tuition and attend school under the same regulations as others. The only difference between Veterans and other students is that they are paid monthly by the Veterans Administration, an amount determined by the hours attended and the number of dependents he has.

To be classified as a full-time student, a Veteran must attend 25 hours per week in a technical course and 30 hours per week in a trade program.

Full details on Veterans training programs may be obtained from any Veterans Service Office. The Veterans Service Office for New Hanover County is located in the Murchison Building in downtown Wilmington, for Pender County in the Courthouse Building in Burgaw, and for Brunswick County at the Police Station in Southport or the Health Center in Shallotte.

THE LIBRARY

The Cape Fear Technical Institute Library is located on the second floor of the main building and contains approximately 7,000 volumes, most of which are related to the trade and technical programs offered by the school. The faculty and students are encouraged to make use of this valuable facility.

While the library books are used primarily by students in the Institute, residents of the area served by the school, and particularly industrial employees are urged to make use of them.

COUNSELING SERVICES

Qualified counselors are available to assist students in selecting an appropriate course of study, to provide occupational and educational information and to discuss scholastic or personal problems which may arise.

GRADING SYSTEM

A letter grade is used to indicate the quality of a student's work in a course. Grade points are assigned for each letter so that a grade-point average can be calculated. The grading system is as follows:

Grade	Explanation	Grade Points Per Credit
A (94 - 100)	Excellent	4
B (86 - 93)	Above average	3
C (78 - 85)	Average	2
D (70 - 77)	Passing	1
E (Below 70)	Failure	0
I	Incomplete	
WP	Withdrew Passing	
WF	Withdrew Failing	

Incomplete will be given only when circumstances justify additional time to complete the course. An incomplete must be removed within six weeks following the quarter it was received; grades not made up within the six weeks will be recorded as an "E."

Report cards are mailed to the student's home shortly after the close of each quarter.

CONDUCT

Students will have but one conduct rule — to conduct themselves as ladies and gentlemen. Area or classroom rules will be designated by instructors or supervisors.

ATTENDANCE

Regular attendance is imperative if a student is to get full benefit of a course of study, therefore absences must be kept to a minimum. Upon returning to school after missing one or more classes, students must get absences excused by contacting the Student Personnel Office. Absences not excused within three days after the student returns to school will be recorded as unexcused. Unexcused absences totaling more days than two-thirds the number of quarter hour credits allowed for the course will result in a penalty of 3⅓ points per absence from the accumulated class grade average. An absence the first day of a quarter, or on the day before or after a holiday will be treated as an unexcused absence with loss of grade points unless prior permission has been granted by the Student Personnel Office.

A student will not be given credit for any course if he or she has been absent from that course more than twenty per cent (20%) of the total hours of the course meets for the quarter.

PROBATION AND SUSPENSION

The probation and suspension policy is designed to give the student every possible opportunity to be successful in his or her training program.

Sub-minimum work in any quarter will result in probationary attendance in the next quarter — sub-minimum work in two consecutive quarters will be cause for suspension.

Any student whose conduct becomes unsatisfactory will be placed on probation — any misconduct after a person is placed on probation will result in prompt suspension.

Absences of five or more consecutive days without notification to the Student Personnel Office will result in the student being dropped from the class roll. The student may be readmitted only through the Student Personnel Office.

WITHDRAWAL

Should it become necessary for a student to withdraw from school during the school year, a request to do so must be made to the Student Personnel Office. Written permission will be issued from the Personnel Office and will protect the student's scholastic records and his right to re-enroll and transfer credits.

DRAFT DEFERMENT

Draft deferment forms are mailed to any student's Selective Service Board upon request after he registers for the first quarter. Technical institute students are deferred under the same regulations as college students. The school is under obligation to notify the board should the student's attendance or quality of work become unsatisfactory.

PLACEMENT SERVICES

Every effort is made by school officials to help students find employment, and to secure employees from graduates of the Institute for interested employers. This is not to imply that the school guarantees employment to any student or employees to any employer. There shall be no charge to industry nor to students for this placement service.

NON-IMMIGRANT ALIEN STUDENTS

"This school is authorized under Federal law to enroll non-immigrant alien students."

TECHNICAL DIVISION

TECHNICAL DIVISION

Technicians are among the fastest growing occupational groups in the United States. In recent years, the needs of an expanding and increasingly-technical economy have greatly intensified the demand not only for engineers and scientists, but also for the technical workers who assist them. Technicians are those workers whose jobs require both knowledge and use of scientific and mathematical theory; specialized education or training in some aspect of technology or science; and who, as a rule, work directly with scientists and engineers. Some jobs held by these technicians are supervisory and require both technical knowledge and the ability to supervise people.

In carrying out their assignments, engineering and science technicians frequently use complex electronic and mechanical instruments, experimental laboratory apparatus, and drafting instruments. These workers engage in virtually every aspect of engineering and scientific work. In research, development, and design work, they conduct experiments or tests; set up, calibrate, and operate instruments; and make calculations. They also assist scientists and engineers in developing experimental equipment and models by making drawings and sketches and frequently do some design work.

Technicians also work in jobs related to production and may aid in the various phases of production operations, such as working out specifications for materials and methods of manufacture, devising tests to insure quality control of products, or making time-and-motion studies (timing and analyzing the worker's movements) designed to improve the efficiency of a particular operation. They may also perform liaison work between engineering and production or other departments.

The Cape Fear Technical Institute provides training in a number of areas which require training beyond the high school but which do not require four years of college preparation. Most of the technical programs are eighteen months in length and are geared to train a person in specific technical areas. Students spend twenty-five to thirty hours per week in classroom and laboratory work; additional time will be needed for outside assignments.

Credit hours granted in the various technical programs are not transferable to other institutions except as an institution may determine that a particular course and credits are applicable to a curriculum offered by that school.

The associate in applied science degree is awarded to students who complete a technical program. To be eligible for the degree, a student must maintain satisfactory grades in all laboratory and class subjects. Certificates are given to those who pass less than the whole course of study.

COURSES OFFERED

Business Administration
Chemical Technology
Drafting & Design Technology
Electronics Technology
Instrumentation Technology
Marine Technology
Secretarial-Engineering and Technical

ADMISSION REQUIREMENTS

1. Must be at least eighteen years of age, or his high school class must have graduated.
2. Must be a high school graduate or equivalent*.
3. Sufficient high school math and science to make success in the program likely. **See prerequisites at the beginning of each course of study in this section.** The Institute operates a learning laboratory in which persons with mathematics or science deficiencies may do make-up work; deficiencies must be removed prior to registration for a course of study.
4. Must demonstrate aptitude for technician training as determined by standard tests. These tests will aid in student selection, placement, and guidance. Guidance and counseling will be available to the student throughout his education, not just at the time of his enrollment.
5. Must be in acceptable condition of physical and mental health. Medical examination may be required at the discretion of the administration.
6. A personal interview is required.

ADMISSION PROCEDURE

1. Submit completed application.
2. Have transcripts of all previous education mailed to the Institute.
3. Have Employment Office mail scores on General Aptitude Test Battery to the Institute.
4. Have doctor mail physical examination form to the Institute if one is required.
5. Come to the school for a personal interview and additional testing when asked to do so.

*See page 62 in General Adult Education Section of this catalogue for details about the high school equivalency certificate.

BUSINESS ADMINISTRATION

In North Carolina the opportunities in business are increasing. With the increasing population and industrial development in this State, business has become more competitive and automated. Better opportunities in business will be filled by students with specialized education beyond the high school level. The Business Administration Curriculum is designed to prepare the student for employment in one of many occupations common to business. Training is aimed at preparing the student in many phases of administrative work that might be encountered in the average business.

The specific objectives of the Business Administration Curriculum are to develop the following competencies:

1. Understanding of the principles of organization and management in business operations.

2. Understanding our economy through study and analysis of the role of production and marketing.

3. Knowledge in specific elements of accounting, finance, and business law.

4. Understanding and skill in effective communication for business.

5. Knowledge of human relations as they apply to successful business operations in a rapidly expanding economy.

The graduate of the Business Administration Curriculum may enter a variety of career opportunities from beginning sales person or office clerk to manager trainee. The duties and responsibilities of this graduate vary in different firms. These encompassments might include: making up and filing reports, tabulating and posting data in various books, sending out bills, checking calculations, adjusting complaints, operating various office machines, and assisting managers in supervising. Positions are available in businesses such as advertising; banking; credit; finance; retailing; wholesaling; hotel, tourist, and travel industry; insurance; transportation; and communications.

BUSINESS ADMINISTRATION

CURRICULUM BY QUARTERS

Course Title			Hrs. Per Week		Quarter Hours
FIRST QUARTER			Class	Lab.	Credit
T-ENG	101	Grammar	3	0	3
T-BUS	102	Typewriting (or Elective)	1	3	2
T-MAT	110	Business Mathematics	5	0	5
T-BUS	101	Introduction to Business	5	0	5
T-ECO	102	Economics	3	0	3
			17	3	18
SECOND QUARTER					
T-ENG	102	Composition	3	0	3
T-BUS	120	Accounting	5	2	6
T-ECO	104	Economics	3	0	3
T-BUS	115	Business Law	3	0	3
T-BUS	123	Business Finance	2	2	3
			16	4	18
THIRD QUARTER					
T-ENG	103	Report Writing	3	0	3
T-BUS	124	Business Finance	3	0	3
T-BUS	110	Office Machines	2	2	3
T-BUS	121	Accounting	5	2	6
T-BUS	116	Business Law	3	0	3
			16	4	18
FOURTH QUARTER					
T-ENG	204	Oral Communication	3	0	3
T-BUS	232	Sales Development	2	2	3
T-EDP	104	Introduction to Data Processing Systems	3	2	4
T-BUS	239	Marketing	5	0	5
		Elective	3	0	3
			16	4	18
FIFTH QUARTER					
T-ENG	206	Business Communication	3	0	3
		Social Science Elective	3	0	3
T-BUS	243	Advertising	3	2	4
T-BUS	235	Business Management	3	0	3
		Electives	6	0	6
			18	2	19
SIXTH QUARTER					
		Social Science Elective	3	0	3
T-BUS	229	Taxes	3	2	4
T-BUS	272	Principles of Supervision	3	0	3
T-BUS	271	Office Management	3	0	3
		Electives	6	0	6
			18	2	19

See pages 72-75 for brief description of courses.

CHEMICAL TECHNOLOGY

This curriculum provides a program of instruction for students in the basic knowledges and skills involved in laboratory and plant operations of the chemical industry. Technical knowledge and laboratory techniques are emphasized and a relationship between the theoretical and practical maintained.

The curriculum is designed to prepare persons to serve in two distinct roles: (1) research assistant to a chemist in the laboratory; and (2) planning and production assistant to chemical engineers in converting the research chemist's discoveries into actual industrial production. Research laboratory assistants must be well-grounded in chemical analysis, testing, and synthesis. Chemical production assistants must have command of a basic knowledge of chemical processing and ability to use main types of equipment and machinery for making chemical products.

This program will provide the basic theoretical knowledge that will enable an individual to become a skilled technician in a rather limited time.

The chemical technician performs quantitative and qualitative chemical analyses of processes involved in a production situation. Tests samples of raw materials to determine that they are within specification limits required for manufacture of desired products. Analyzes samples of product intermediates at manufacturing steps so as to supply data to processing personnel by which they may control reactions involved, to determine whether processing is being performed according to plant specifications, and to solve current production problems. Analyzes samples of finished products to determine whether quality warrants its release for shipment, analytical methods to determine percentages, such as acetone extract, heating loss, or ash content. Prepares laboratory test reports and checks analyses with specifications and consults with laboratory supervisors. Makes special analyses as necessary. May secure samples used.

CHEMICAL TECHNOLOGY

CURRICULUM BY QUARTERS

Course Title			Hrs. Per Week		Quarter Hours
FIRST QUARTER			Class	Lab.	Credit
T-ENG	101	Grammar	3	0	3
T-MAT	101	Technical Mathematics	5	0	5
T-PHY	101	Physics: Properties of Matter	3	2	4
T-DFT	101	Technical Drafting	0	6	2
T-CHM	111	General Chemistry	4	2	5
			15	10	19
SECOND QUARTER					
T-ENG	102	Composition	3	0	3
T-MAT	102	Technical Mathematics	5	0	5
T-PHY	102	Physics: Work, Energy, Power	3	2	4
T-DFT	102	Technical Drafting	0	6	2
T-CHM	112	General Chemistry	4	2	5
			15	10	19
THIRD QUARTER					
T-ENG	103	Report Writing	3	0	3
T-MAT	103	Technical Mathematics	5	0	5
T-PHY	103	Physics: Electricity	3	2	4
T-CHM	121	Quantitative Chemical Analysis	3	6	5
		Elective	3	0	3
			17	8	20
FOURTH QUARTER					
T-ENG	204	Oral Communications	3	0	3
T-CHM	222	Quantitative Chemical Analysis	2	9	5
T-CHM	227	Physics: Chemistry	3	2	4
		Electives	6	0	6
			14	11	18
FIFTH QUARTER					
T-CHM	231	Organic Chemistry	3	6	5
T-CHM	241	Industrial Chemical Analysis	3	10	7
		Elective	3	0	3
			9	16	15
SIXTH QUARTER					
T-CHM	232	Organic Chemistry	3	6	5
T-CHM	242	Industrial Chemical Analysis	3	10	7
		Elective	3	0	3
			9	16	15

See pages 75-79 for brief description of courses.

DRAFTING & DESIGN — MECHANICAL

This curriculum description was prepared for the purpose of outlining a training program for students of mechanical drafting and design technology. There are certain identifiable duties which are common to all technicians of this general classification and which comprise the basic areas of technical knowledge they need. This curriculum has been designed for training persons in the accepted performance of these basic duties that will be assigned, and to enable the individual student to become proficient in a short time after he becomes employed in the industry.

Courses in general education have been included to give a student the assurance and understanding that comes with education upon a broad base. The technician associates with many levels of thought and expression — administrative personnel, scientists, engineers, skilled workmen — and must be able to communicate effectively with all levels. Courses containing essential information from related subject areas, such as mathematics, physics, and mechanics have been included in order to provide the student a better academic base for his training. Emphasis is placed upon ability to think and plan, as well as drafting procedures and techniques.

Mechanical drafting and design technicians are concerned with the preparation of drawings for design proposals, for experimental models and items for production for use.

These technicians perform many aspects of drafting in a specialized field, such as the developing of the drawing of a section, subassembly or major component. Investigating design factors and availability of material and equipment, production methods and facilities are frequent assignments. They assist in the design of units and controls from specifications by utilizing drawings of existing units and reports on functional performance. They may draw components in industrial fields based on engineers' original design concepts or specific ideas. Also, they may be assigned as coordinators for the execution of related work of other design, production, tooling, material and planning groups. Technicians with experience in this classification may often supervise the preparation of working drawings.

These technicians are employed in many types of manufacturing, fabrication, research development and service industries. Substantial numbers also are employed in communications, transportation, public utilities, consulting engineering firms, and federal, state, and local governments.

DRAFTING & DESIGN — MECHANICAL

CURRICULUM BY QUARTERS

		Course Title	Hrs. Per Week Class	Lab.	Quarter Hours Credit
FIRST QUARTER					
T-ENG	101	Grammar	3	0	3
T-MAT	101	Technical Mathematics	5	0	5
T-PHY	101	Physics: Properties of Matter	3	2	4
T-DFT	101	Technical Drafting	0	6	2
T-MEC	101	Machine Processes	0	6	2
			11	14	16
SECOND QUARTER					
T-ENG	102	Composition	3	0	3
T-MAT	102	Technical Mathematics	5	0	5
T-PHY	102	Physics: Work, Energy, Power	3	2	4
T-DFT	102	Technical Drafting	0	6	2
T-MEC	102	Machine Processes	0	6	2
			11	14	16
THIRD QUARTER					
T-ENG	103	Report Writing	3	0	3
T-MAT	103	Technical Mathematics	5	0	5
T-PHY	103	Physics: Electricity	3	2	4
T-PHY	106	Applied Mechanics	3	3	4
T-DFT	103	Technical Drafting	0	6	2
			14	11	18
FOURTH QUARTER					
T-ENG	204	Oral Communication	3	0	3
T-DFT	201	Technical Drafting	2	6	4
T-DFT	204	Descriptive Geometry	2	4	4
T-MEC	205	Strength of Materials	2	0	2
T-MEC	210	Physical Metallurgy	3	3	4
			12	13	17
FIFTH QUARTER					
		Social Science Elective	3	0	3
T-DFT	205	Design Drafting I	2	6	4
T-DFT	211	Mechanisms	3	2	4
T-MEC	211	Physical Metallurgy	3	3	4
		Elective	3	0	3
			14	11	18
SIXTH QUARTER					
		Social Science Elective	3	0	3
T-DFT	206	Design Drafting II	4	9	7
T-MEC	235	Hydraulics & Pneumatics	3	3	4
		Elective	3	0	3
			13	12	13

See pages 79-83 for brief description of courses.

ELECTRONICS TECHNOLOGY

The field of electronics has developed at a rapid pace since the turn of the century. For many years the major concern of electronics was in the area of communications. Developments during World War II and in the period since have revolutionized production techniques. New industries have been established to supplement the need and demand for electronics equipment.

Many opportunities exist for men and women with a technical education in electronics. This curriculum provides a basic background in electronic related theory with practical applications of electronics for business and industry. Courses are designed to develop competent electronics technicians who may take their place as an assistant to an engineer, or as a liaison between the engineer and the skilled craftsman.

The electronics technician may start in one or more of the following areas: research, design, development, production, maintenance or sales. He may be an assistant to an engineer, an engineering aide, laboratory technician, supervisor or equipment specialist. His training is similar to that of an engineer, but in less depth and more practical in application.

ELECTRONICS TECHNOLOGY

CURRICULUM BY QUARTERS

Course Title			Hrs. Per Week Class	Lab.	Quarter Hours Credit
FIRST QUARTER					
T-ENG	101	Grammar	3	0	3
T-MAT	101	Technical Mathematics	5	0	5
T-PHY	101	Physics: Properties of Matter	3	2	4
T-DFT	101	Technical Drafting	0	6	2
T-ELC	101	Fundamentals of Electricity	4	4	6
			15	12	20
SECOND QUARTER					
T-ENG	102	Composition	3	0	3
T-MAT	102	Technical Mathematics	5	0	5
T-PHY	102	Physics: Work, Energy, Power	3	2	4
T-DFT	102	Technical Drafting	0	6	2
T-ELC	102	Fundamentals of Electricity	4	4	6
			15	12	20
THIRD QUARTER					
T-ENG	103	Report Writing	3	0	3
T-MAT	103	Technical Mathematics	5	0	5
T-ELN	101	Electronic Instruments & Measurements	1	6	3
T-ELN	104	Control Devices	4	6	6
			13	12	17
FOURTH QUARTER					
T-ENG	204	Oral Communication	3	0	3
T-MAT	201	Technical Mathematics	5	0	5
T-PHY	104	Physics: Light and Sound	3	2	4
T-ELN	205	Applications of Vac. Tubes & Trans.	6	6	8
			17	8	20
FIFTH QUARTER					
		Social Science Elective	3	0	3
T-ELN	210	Semiconductor Circuit Analysis	5	3	6
T-ELN	214	Wave Shaping and Pulse Circuits	2	3	3
T-ELN	229	Electronics Project	3	6	5
			13	12	17
SIXTH QUARTER					
T-ELN	215	Wave Shaping and Pulse Circuits	2	3	3
T-ELN	220	Electronic Systems	5	6	7
T-ELN	230	Electronics Project	3	6	5
			10	15	15

See pages 84-88 for brief description of courses.

INSTRUMENTATION TECHNOLOGY

Measuring and controlling instruments are now in such wide spread use in our modern world that we take them for granted.

The progress of industry depends on precise, effective, and diversified instruments. The Instrumentation Technician has a tremendous responsibility to both production and production control in all industries.

Instruments are used for the measurement and control of industrial manufacturing, conversion, or treating processes. An Instrumentation Technician must deal with variables that affect properties such as temperature, pressure, flow, level, humidity, density, viscosity, etc. In short, instrumentation men are key personnel to keeping a manufacturing firm running. Should any major piece of equipment break down, usually it remains out of operation until such time the instrumentation man can make necessary repairs or adjustments. The Instrumentation Technician in most manufacturing plants works with or assists engineers in their work, and therefore training is similar to that of the engineer.

In many plants when a piece of equipment breaks down employees are laid off until such time the instrumentation man can again repair the equipment and production be resumed. His knowledge of both mechanics and electronics are key factors to how quickly a machine or plant may again resume operation.

INSTRUMENTATION TECHNOLOGY

CURRICULUM BY QUARTERS

Course Title			Hrs. Per Week		Quarter Hours
			Class	Lab.	Credit
FIRST QUARTER					
T-PHY	101	Physics: Properties of Matter	3	2	4
T-MAT	101	Technical Mathematics	5	0	5
T-ELC	101	Fundamentals of Electricity	4	4	6
T-ENG	101	Grammar	3	0	3
T-MEA	101	Measuring Principles	1	3	2
			16	9	20
SECOND QUARTER					
T-ELC	102	Fundamentals of Electricity	4	4	6
T-PHY	102	Physics: Work, Energy, Power	3	2	4
T-MAT	102	Technical Mathematics	5	0	5
T-INS	101	Instrument Shop Practices	0	3	1
T-MEA	102	Measuring and Control	1	3	2
			13	12	18
THIRD QUARTER					
T-ENG	103	Report Writing	3	0	3
T-MAT	103	Technical Mathematics	5	0	5
T-DFT	101	Technical Drafting	0	6	2
T-MEA	103	Measuring and Control	5	6	7
			13	12	17
FOURTH QUARTER					
T-MAT	201	Technical Mathematics	5	0	5
T-ENG	204	Oral Communication	3	0	3
T-ELN	101	Elec. Instruments and Measurements	3	6	5
T-PHY	211	Physical and Chemical Analysis	2	6	4
			13	12	17
FIFTH QUARTER					
T-ELN	210	Semiconductor Circuit Analysis	5	3	6
T-ELN	216	Control Principles and Telemetry	2	5	4
T-ELN	217	Calibration and Standardization	1	3	2
T-ECD	202	General and Industrial Economics	3	0	3
T-ELN	218	Electronics for Instrumentation	3	0	3
			14	11	18
SIXTH QUARTER					
T-ELN	226	Control Systems Analysis	3	6	5
T-ELN	227	Computer Principles and Systems	1	3	2
T-ELN	228	Instrumentation Projects	3	6	5
T-ISC	201	Industrial Organizations	3	0	3
			10	15	15

MARINE TECHNOLOGY

Scientific advances of the past decade command a strong commercial fishing training program for North Carolina. A thorough study of marine occupations has shown a great need for personnel trained in the use of modern marine equipment and techniques. The technological developments during and since World War II have made available to the mariner new sophisticated equipment, such as electronic devices for navigation, electronic fish-finders, improved nets and deck gear for rapid handling of the catch, and newly-developed processing methods.

As in other facets of our mechanized life, the methods used in past years do not suffice today. Efficiency in the use of all the modern tools available is necessary for success in today's marine operations.

The Marine Technology program includes a curriculum with a strong base of the science and mathematics needed to meet the challenging requirements of the marine research technician. This two-year curriculum will provide the student with a first-hand opportunity to become proficient in the knowledge and skills of the mariner. Practical operations will be conducted aboard the school's ship which is docked at the Cape Fear Technical Institute at Wilmington, North Carolina.

Each student will be assigned daily duties in maintaining the training vessel in addition to classroom instruction and will be directly involved in the operation of the ship on all training cruises.

Graduates of this curriculum may perform experiments and data collecting activities associated with a marine biology laboratory; may operate radar, loran, direction finders, ship radio, depth recorders, fish-finders, and the gyro compass. In addition, they may participate in fish-dragging operations, use of electronic devices, and perform the daily routine tasks necessary for the proper maintenance of the vessel. Marine Technology graduates will have received instruction in navigation, oceanography, marine engineering, and marine biology. Graduates of this curriculum may find job opportunities with the U. S. Navy Oceanographic Office, the U. S. Geodetic Survey, research foundations, private survey companies, marine salvage companies, marine construction companies, fish-processing plants, marinas, boat yards or private fishing concerns. They may also find employment on towboats and yachts.

Prerequisites: Admission requirements and at least one year of high school algebra.

MARINE TECHNOLOGY 1968-69

CURRICULUM BY QUARTERS

Course Title			Hrs. Per Week Class	Lab.	Quarter Hours Credit
FIRST QUARTER (FALL)					
T-ENG	101	Grammar	3	0	3
T-MAT	101	Technical Mathematics	5	0	5
T-MSC	101	Navigation and Seamanship	2	6	4
T-PME	101	Internal Comb. Engines & Aux. Eqp.	2	3	3
		Ship Maintenance	0	9	1
			12	18	16
SECOND QUARTER (WINTER)					
T-ENG	102	Composition	3	0	3
T-MAT	102	Technical Mathematics	5	0	5
T-MSC	102	Navigation and Seamanship	2	6	4
T-PME	102	Internal Comb. Engine & Aux. Eqp.	2	3	3
		Ship Maintenance	0	9	1
			12	18	16
THIRD QUARTER (SPRING)					
T-MAT	103	Technical Mathematics	5	0	5
T-PHY	101	Physics: Properties of Matter	3	2	4
T-BIO	110	Biology, General	3	2	4
T-MSC	103	Navigation and Seamanship	2	4	4
		Ship Maintenance	0	9	1
			13	17	18
FOURTH QUARTER (SUMMER)					
T-PHY	102	Physics: Work, Energy, Power	3	2	4
T-CHM	101	Chemistry	4	2	5
T-MSC	104	Navigation and Seamanship	2	5	4
		Ship Maintenance	0	9	1
			10	20	16
FIFTH QUARTER (FALL)					
T-ENG	103	Report Writing	3	0	3
T-MSC	207	Introduction to Oceanography	3	4	5
T-PHY	103	Physics: Electricity	3	2	4
		Ship Maintenance	0	9	1
		Social Studies Elective	3	0	3
			12	15	16
SIXTH QUARTER (WINTER)					
T-ENG	204	Oral Communications	3	0	3
T-BIO	121	Marine Biology	3	4	5
T-ELN	132	Shipboard Electronic Equipment	3	2	4
T-MSC	208	Oceanography (Physical)	3	2	4
		Ship Maintenance	0	9	1
			12	17	17
SEVENTH QUARTER (SPRING)					
		Social Studies Elective	3	0	3
T-MSC	209	Oceanography (Chemical)	3	4	5
T-MSC	211	Fishing Operation	3	4	5
		Ship Maintenance	0	9	1
T-PSY	211	Basic Statistics	3	0	3
			12	17	17
EIGHTH QUARTER (SUMMER)					
T-AHR	206	Marine Refrigeration	2	4	4
T-MSC	204	Cartography	2	4	4
T-MSC	213	Marine Fisheries Science	3	2	4
T-MSC	212	Fishing Operations	3	4	5
		Ship Maintenance	0	6	1
			10	20	18

See pages 91-95 for brief description of courses.

SECRETARIAL — ENGINEERING AND TECHNICAL

The Engineering and Technical Secretary Curriculum is designed to prepare a student for a position in the office of a firm dealing in research, development and production in the scientific fields. The curriculum offers students the necessary secretarial skills and the required background of understanding and appreciation of the scientific method, the beginnings of a technical vocabulary and a feeling of respect for accuracy that will be essential in later work in the field.

Graduates of this program may qualify for employment as stenographer-secretaries, technical secretaries, and possibly as private secretaries. They are in demand where engineers and other technical personnel find a need for secretarial help who can understand the specialized language of Electrical, Mechanical, Civil, or Chemical Engineers. The duties of an engineering and technical secretary may consist of taking dictation and reports, meeting office callers and screening telephone calls, filing, and scheduling appointments. Graduates of this program, since they have received a background of science and engineering terminology in addition to their business background, are admirably prepared to work with engineering reports, records and correspondence.

SECRETARIAL — ENGINEERING AND TECHNICAL

CURRICULUM BY QUARTERS

Course Title			Hrs. Per Week		Quarter Hours
FIRST QUARTER			Class	Lab.	Credit
T-ENG	101	Grammar	3	0	3
T-BUS	102	Typewriting (Or Elective)	1	3	2
T-MAT	110	Business Mathematics	5	0	5
T-BUS	101	Introduction to Business	5	0	5
T-BUS	106	Shorthand (Or Elective)	3	2	4
			17	5	19
SECOND QUARTER					
T-ENG	102	Composition	3	0	3
T-BUS	103	Typewriting (Or Elective)	1	3	2
T-BUS	107	Shorthand	3	2	4
T-BUS	120	Accounting	5	2	6
T-BUS	115	Business Law	3	0	3
			15	7	18
THIRD QUARTER					
T-ENG	103	Report Writing	3	0	3
T-BUS	104	Typewriting	1	3	2
T-BUS	108	Shorthand	3	2	4
T-BUS	110	Office Machines	2	2	3
T-BUS	112	Filing	3	0	3
T-BUS	183T	Terminology and Vocabulary (Technical)	3	0	3
			15	7	18
FOURTH QUARTER					
T-ENG	204	Oral Communication	3	0	3
T-BUS	205	Advanced Typewriting	2	3	3
T-BUS	206T	Dictation and Transcription (Technical)	3	2	4
T-BUS	211	Office Machines	2	2	3
T-EDP	104	Introduction to Data Processing System	3	2	4
			13	9	17
FIFTH QUARTER					
T-ENG	206	Business Communication	3	0	3
T-BUS	207T	Dictation and Transcription (Technical)	3	3	4
T-BUS	214	Secretarial Procedures	3	2	4
		Social Science Elective	3	0	3
		Elective	3	0	3
			15	5	17
SIXTH QUARTER					
T-BUS	272	Principles of Supervision	3	0	3
		Social Science Elective	3	0	3
T-BUS	208T	Dictation and Transcription (Technical)	3	2	4
T-BUS	271	Office Management	3	0	3
		Electives	6	0	6
			18	2	19

See pages 95-98 for brief description of courses.

TRADE DIVISION

TRADE DIVISION

In North Carolina as well as throughout the nation, the demand for skilled tradesmen is at an all-time high. Hardly a day passes that the Institute does not have at least one call from industry looking for prospective employees. Graduates of the trade programs sometimes have as many as four or five offers of employment upon graduation.

Students in the skilled trade programs are trained in shops similar to those of private industries. The shops contain testing and measuring instruments, tools, and equipment of the same size and types as found in private firms. The facilities make possible practical instruction which is essential to the preparation of skilled workers needed by today's modern industries. Students in these trade programs spend twenty-five to thirty hours per week in school; this time is divided between classroom studies and practice shop-work.

Skilled craftsmanship in the occupation, educational background and leadership ability are the bases for instructor selection in these trade courses.

A diploma is awarded to those students who satisfactorily complete the one-year (12 months) trade program. To be eligible for the diploma, a satisfactory passing grade must be maintained in all shop work and related class subjects. Certificates are issued to those who pass less than the whole course of study.

COURSES OFFERED

One year (12 months) training courses are offered in the following skilled trades:

Automotive Mechanics
Drafting, Mechanical
Heating, Refrigeration & Air-Conditioning
Machinist
Marine Diesel Mechanics
Operating Room Assistant (6 months)
Practical Nursing
Radio & Television Servicing
Welding

ADMISSION REQUIREMENTS

1. Must be at least 18 years of age, or his high school class must have graduated.

2. Should be a high school graduate but must have completed at least eight (8) units of high school work — exceptions may be made for more mature adults who have been out of school for some time.

3. Must demonstrate aptitude for trade-vocational training as determined by standard tests. These tests will aid in student selection, placement, and guidance. Guidance and counseling will be available to the student throughout his education.

4. Must have sufficient mathematics to make success in the course of study likely.

5. Must be in acceptable condition of physical and mental health. Medical examination is required in some courses and may be required in others at the discretion of the Administration.

6. A personal interview is required.

ADMISSION PROCEDURE

1. Submit completed application.

2. Have transcripts of all previous education mailed to the Institute.

3. Have Employment Office mail scores on General Aptitude Test Battery to the Institute.

4. Have doctor mail physical examination form to Institute if one is required.

5. Come to the school for personal interview and additional testing when asked to do so.

AUTOMOTIVE MECHANICS

This curriculum provides a training program for developing the basic knowledge and skills needed to inspect, diagnose, repair or adjust automotive vehicles. Manual skills are developed in practical shop-work. Thorough understanding of the operating principles involved in the modern automobile comes in class assignments, discussion, and shop practice.

Complexity in automotive vehicles increases each year because of scientific discovery and new engineering. These changes are reflected not only in passenger vehicles, but also in trucks, buses and a variety of gasoline-powered equipment. This curriculum provides a basis for the student to compare and adapt to new techniques for servicing and repair as vehicles are changed year by year.

Automobile mechanics maintain and repair mechanical, electrical, and body parts of passenger cars, trucks, and buses. In some communities and rural areas they also may service tractors or marine engines and other gasoline-powered equipment. Mechanics inspect and test to determine the causes of faulty operation. They repair or replace defective parts to restore the vehicle or machine to proper operating condition. They use shop manuals and other technical publications.

Automotive mechanics in smaller shops usually are general mechanics qualified to perform a variety of repair jobs. A large number of automobile mechanics specialize in particular types of repair work. For example, some may specialize in repairing only power steering and power brakes, or automatic transmissions. Usually such specialists have an all-round knowledge of automotive repair and may occasionally be called upon to do other types of work.

AUTOMOTIVE MECHANICS

CURRICULUM BY QUARTERS

		Course Title	Hrs. Per Week Class	Lab.	Quarter Hours Credit
FIRST QUARTER					
PME	1101	Internal Combustion Engines	3	15	8
MAT	1101	Fundamentals of Mathematics APPLIED	5	0	5
ENG	1101	Reading Improvement	2	0	2
PHY	1101	Applied Science	3	2	4
			13	17	19
SECOND QUARTER					
PME	1102	Engine Electrical and Fuel Systems	5	14	10
ENG	1102	Communication Skills	3	0	3
DFT	1101	Schematics and Diagrams: Power Mech.	0	3	1
PHY	1102	Applied Science	3	2	4
			11	19	18
THIRD QUARTER					
AUT	1120	Automotive Analysis	3	6	5
AUT	1123	Auto. Chassis & Suspensions Systems	3	9	6
AUT	1121	Braking Systems	3	3	4
PSY	1101	Human Relations	3	0	3
			12	18	18
FOURTH QUARTER					
AUT	1124	Automotive Power-Train Systems	3	9	6
AUT	1125	Automotive Servicing	3	9	6
BUS	1103	Small Business Operations	3	0	3
WLD	1101	Basic Gas Welding	0	3	1
			9	21	16

See pages 99-101 for brief description of courses.

DRAFTING — MECHANICAL

This curriculum is designed to prepare students to enter the field of mechanical drafting. The first two quarters contain courses basic to all fields of drafting. The third and fourth quarters contain specialization and related courses that prepare one to enter mechanical drafting occupations.

Each course is prepared to enable an individual to advance rapidly in drafting proficiency upon entering the field of work. Courses are arranged in sequence to develop drafting skills and proficiency in mathematics and science. The draftsman associates with many levels of personnel — administrative, architects, engineers, skilled workmen — and must be able to communicate effectively with them. Courses to develop knowledge and skills in communication, human relations, economics and industrial organization are provided to assist the student in developing understanding and confidence in his relations with other persons.

Draftsman prepares clear, complete, and accurate working plans and detail drawings, from rough or detailed sketches or notes for engineering or manufacturing purposes, according to the specified dimensions: makes final sketch of the proposed drawing, checking dimension of parts, materials to be used, the relation of one part to another, and the relation of the various parts to the whole structure. Makes any adjustments or changes necessary or desired. Inks in lines and letters on pencil drawings as required. Exercises manual skill in the manipulation of triangle, T-square, and other drafting tools. Lays tracing paper on drawing and traces drawing in pencil or ink. Makes charts for representation of statistical data. Makes finished designs from sketches. Utilizes knowledge of various machines, engineering practices, mathematics, building materials, and other physical sciences to complete the drawings.

Mechanical draftsman performs the general duties of a draftsman and also specializes in making rough drafting sketches of proposed mechanical devices, and then drawing necessary details. Prepares accurate drawings of parts or machines from specifications.

DRAFTING — MECHANICAL

CURRICULUM BY QUARTERS

		Course Title	Hrs. Per Week Class	Lab.	Quarter Hours Credit
FIRST QUARTER					
DFT	1121	Drafting	3	15	8
MAT	1101	Fundamentals of Mathematics	5	0	5
ENG	1101	Reading Improvement	2	0	2
PHY	1101	Applied Science	3	2	4
			13	17	19
SECOND QUARTER					
DFT	1122	Drafting	3	11	7
DFT	1125	Descriptive Geometry	2	3	3
MAT	1103	Geometry	3	0	3
ENG	1102	Communication Skills	3	0	3
PHY	1102	Applied Science	3	2	4
			14	16	20
THIRD QUARTER					
DFT	1131	Mechanical Drafting	3	12	7
MAT	1104	Trigonometry	3	0	3
PSY	1101	Human Relations	3	0	3
MEC	1113	Shop ~~Processes~~ PRACTICE	1	3	2
MEC	1115	~~Treatment of Ferrous Metals~~ APPLIED METALURGY	2	3	3
			12	18	18
FOURTH QUARTER					
DFT	1132	Mechanical Drafting	3	12	7
MEC	1114	Shop Processes PRACTICE	1	3	2
MEC	1116	~~Treatment of Non-Ferrous Metals~~ APPLIED METALURGY	2	3	3
BUS	1105	Industrial Organization	3	0	3
		Elective	3	0	3
			12	18	18

See pages 101-103 for brief description of courses.

HEATING, REFRIGERATION & AIR-CONDITIONING

Through this curriculum the Cape Fear Technical Institute provides a training program for the instruction of students in the basic knowledges and skills involved in servicing and installing heating, air-conditioning and refrigeration equipment. Manual skills are emphasized in practical shop work combined with a thorough understanding of the operating principles involved in heating, air-conditioning and refrigeration.

The heating, air-conditioning and refrigeration industry is one of the fastest growing fields today. With the ever-increasing use of air-conditioning in industries and the even faster growing use of air-conditioning and heating systems in domestic use, the need for service people to install and maintain this equipment has surpassed the available supply of trained personnel. This need for trained people has become so great that a program for training is necessary. Because of the increasing engineering complexity caused by the demand for more efficient, more compact, and dual capacity units, this curriculum to train people and to upgrade present-day servicemen has been prepared.

In North Carolina a contractor in the heating, air-conditioning and refrigeration field is required by law to hold a state license if his work is done in cities of over 10,000 population. The serviceman or mechanic is not required to hold a license. The material presented herein is basic to the passing of this state's license examination. With job experience, a graduate should be able to successfully pass the examination and acquire a contractor's license.

The heating, air-conditioning and refrigeration mechanic installs, services and repairs equipment used in the heating and cooling of domestic buildings, industrial buildings and mobile-type units. In general, a person will perform similar duties in any one of these fields, but often becomes a specialist in one. The mechanic uses blueprints and schematics, thus requiring a knowledge of blueprint reading. He services, installs and maintains commercial and domestic refrigeration components, heating devices, air and liquid flow devices used in comfort heating of air and liquids, and fuel storage units. The duties may involve mechanical repairs, electrical motor repairs, control wiring, electrical and gas tests, pipe and tubing fitting, duct and fitting fabrication, equipment installation, shop sketching of equipment and flow devices for installations, and equipment sizing.

HEATING, REFRIGERATION & AIR CONDITIONING

CURRICULUM BY QUARTERS

		Course Title	Hrs. Per Week Class	Lab.	Quarter Hours Credit
FIRST QUARTER (FALL)					
AHR	1116	Oil Burner Installation and Service	4	6	6
MAT	1115	Electrical Mathematics	5	0	5
PHY	1101	Applied Science	3	0	3
DFT	1104	Blueprint Reading	0	2	1
AHR	1121	Principles of Refrigeration	3	2	4
			15	10	19
SECOND QUARTER (WINTER)					
AHR	1117	Gas Burners, Electric Heat & Liquid Heat Applications	4	3	5
AHR	1122	Domestic Refrigeration	2	6	4
ELEC	1101	Applied Electricity	2	0	2
DFT	1116	Applied Drafting	2	2	3
AHR	1113	Calculation of Heat Loss	1	0	1
WLD	1101	Basic Gas Welding	0	3	1
			11	14	16
THIRD QUARTER (SPRING)					
AHR	1124	Air Conditioning & Refrig. Serv.	3	7	6
AHR	1106	Calculations of Heat Loads	3	0	3
ELEC	1102	Applied Electricity	1	2	2
AHR	1123	Principles of Air-Conditioning	4	0	4
MAT	1103	Geometry	5	0	5
			16	9	20
FOURTH QUARTER (SUMMER)					
AHR	1126	All Year Comfort Systems	3	9	6
AHR	1109	Estimating for Refrigeration & Cooling	3	0	3
BUS	1103	Small Business Operations	3	0	3
MEC	1120	Duct Construction and Maintenance	3	4	4
			12	13	16

MACHINIST

This curriculum was prepared to meet a definite need for training of machinists. Surveys recently completed in North Carolina show that many of the existing industries lack time and facilities for training enough machinists to meet present and planned needs. Expanding industries already located in our State and new industries under development invariably express the need for skilled craftsmen who have the background knowledge and potential to advance.

This guide is designed to give learners the opportunity to acquire basic skills and the related technical information necessary to gain employment and build a profitable career in the machine shop industry in the State. It is comprised of the joint views of committees responsible for its development.

The machinist is a skilled metal worker who shapes metal parts by using machine tools and hand tools. His training and experience enable him to plan and carry through all the operations needed in turning out a machined product and to switch readily from one kind of product to another. A machinist is able to select the proper tools and material required for each job and to plan the cutting and finishing operations in their proper order so that he can complete the finished work according to blueprint or written specifications. He makes standard shop computations relating to dimensions of work, tooling, feeds, and speeds of machining. He often uses precision measuring instruments such as micrometers and gauges to measure the accuracy of his work to thousandths of an inch.

This skilled worker must be able to set up and operate most types of machine tools. The machinist also must know the composition of metals so that he can heat and quench cutting tools and parts to improve machinability. His wide knowledge enables him to turn a block of metal into an intricate, precise part.

MACHINE TRADES

MACHINIST

CURRICULUM BY QUARTERS

		Course Title	Hrs. Per Week		Quarter Hours
FIRST QUARTER			Class	Lab.	Credit
MEC	1101	Machine Shop Theory and Practice	3	12	7
MAT	1101	Fundamentals of Mathematics	5	0	5
DFT	1104	Blueprint Reading: Mechanical	0	3	1
ENG	1101	Reading Improvement	2	0	2
PHY	1101	Applied Science	3	2	4
			13	17	19
SECOND QUARTER					
MEC	1102	Machine Shop Theory and Practice	3	12	7
MAT	1103	~~Geometry~~ APPLIED MATH	3	0	3
DFT	1105	Blueprint Reading: Mechanical	1	3	2
PHY	1102	Applied Science	3	2	4
ENG	1102	Communication Skills	3	0	3
			13	17	19
THIRD QUARTER					
MEC	1103	Machine Shop Theory and Practice	3	12	7
MEC	1115	~~Treatment of Ferrous Metals~~ APPLIED METALURGY	2	3	3
DFT	1106	Blueprint Reading: Mechanical	1	3	2
MAT	1104	~~Trigonometry~~ APPLIED MATH	3	0	3
PSY	1101	Human Relations	3	0	3
			12	18	18
FOURTH QUARTER					
MEC	1104	Machine Shop Theory and Practice	3	12	7
MEC	1116	~~Treatment of Non-Ferrous Metals~~ APPLIED METALURGY	2	3	3
WLD	1101	Basic ~~Gas~~ Welding	1	3	2
MAT	1123	~~Machinist~~ Mathematics APPLIED	3	0	3
BUS	1105	Industrial Organizations	3	0	3
			12	18	18

See pages 106-108 for brief description of courses.

MARINE DIESEL MECHANICS

Marine mechanics are in demand along the coastal waterways of North Carolina and other states where fishing and water recreation industries exist. This is a rapidly growing industry in many areas of the country. Single boat operations to large fleets exist for sport and commercial fishing and various recreational activities. These boats use propulsion systems ranging from one cylinder motors to large diesel units. These units require trained and skilled mechanics to maintain and service them for proper operation.

This program provides training for individuals interested in becoming mechanics to service and maintain the propulsion system for boats and various types of marine equipment. Manual skills in servicing marine equipment are developed in practical shop work. A thorough understanding of the operating principles of this equipment is provided through classroom instruction, laboratory experiments, group discussions and shop practice.

Marine engine mechanics maintain and repair mechanical, electrical, hydraulic, and pneumatic equipment used on boats and in industrial applications. Mechanics inspect and test to determine the causes of faulty operation; repair or replace defective parts to restore the machine or unit to proper operating condition; use shop manuals, manufacturer's maintenance manuals, and other technical publications.

Marine engine mechanics in smaller shops or self-employed persons usually are general mechanics qualified to perform a variety of repair jobs. A large number of marine engine mechanics specialize in particular types of repair work. For example, some may specialize in repairing only electrical equipment, or injector servicing. Others specialize in clutches and power train equipment. Usually such specialists have an all-round knowledge of marine engine operation and may occasionally be called upon to do other types of work.

MARINE DIESEL MECHANICS

CURRICULUM BY QUARTERS

		Course Title	Hrs. Per Week Class	Lab.	Quarter Hours Credit
FIRST QUARTER					
MDE	1101	Marine Diesel Eng. Theory & Practice	5	10	8
MAT	1120	Fundamentals of Mathematics	5	0	5
PHY	1104	Applied Physics I	1	2	2
MEC	1121	Machine Shop Theory and Practice	2	3	3
ENG	1101	Reading Improvement	2	0	2
			15	15	20
SECOND QUARTER					
MDE	1102	Marine Diesel Eng. Theory & Practice	5	9	8
MAT	1123	Machinist Mathematics	5	0	5
MELEC	1101	Marine Electricity	1	3	2
DFT	1121	Blueprint Reading	1	3	2
ENG	1102	Communication Skills	3	0	3
			15	15	20
THIRD QUARTER					
MDE	1103	Marine Diesel Eng. Theory & Practice	5	12	9
MELEC	1102	Marine Electricity	1	3	2
MEC	1112	Welding	0	3	1
SS	1101	Safety at Sea	1	2	2
PSY	1101	Human Relations	3	0	3
			10	20	17
FOURTH QUARTER					
MDE	1104	Marine Diesel Eng. Theory & Practice	5	12	9
MELEC	1103	Marine Electricity	1	3	2
MEC	1121	Machine Shop Theory & Practice	0	6	2
BUS	1105	Industrial Organizations	3	0	3
			9	21	16

See pages 108-111 for brief description of courses.

OPERATING ROOM TECHNICIANS

With more new hospitals being built, and the rapid advancement in Surgical Techniques there is an increasing demand for more well-trained personnel in the Operating Room area.

The aim of the Operating Room Technician Course is to make available to qualified persons the opportunity to prepare themselves to function intelligently under the direct and continuous supervision of qualified professional nurses in hospital areas which are concerned with principles and practices of Surgical Aseptics in Operating Rooms, Delivery Rooms, and Central Service Department.

Students are selected on the basis of demonstrated aptitude for O.R. Technicians as determined by pre-entrance tests, interviews with faculty members, including Surgeons, High School record, character references, and medical reports.

During the six-months course the student is expected to grow continuously in acquisition of knowledge and understanding, related to Operating Room Technique, Basic Anatomy, Physiology, Basic Microbiology, Aseptics, Communication Skills, Inter-personnel relationship, and the use of good judgment. Evaluation of student performance consists of tests on all phases of course content, evaluation of clinical performance, and evaluation of adjustment to the responsibilities that is expected of an Operating Room Technician. A passing score is required on all graded work, plus demonstrated progress in the clinical area of the Operating Room.

Students completing this Operating Room Technician Course will be qualified to work in the Operating Room and assist the doctor or surgeon while under the supervision of the professional nurse.

OPERATING ROOM TECHNICIANS

Course Title	Hrs. Per Week Class	Lab.	Quarter Hours Credit
FIRST QUARTER			
ORA 1101 Operating Room Assistant I	12	9	15
SECOND QUARTER			
ORA 1102 Operating Room Assistant II	6	18	12

See page 111 for brief description of course.

PRACTICAL NURSE EDUCATION

The accelerated growth of population in North Carolina and rapid advancement in medical technology demand an increased number of well-trained personnel for health services. Realizing this need, the State Department of Community Colleges, in conjunction with local hospitals, administers programs of practical nurse education in local systems, community colleges, technical institutes and in industrial education centers throughout the state.

The aim of the Practical Nurse Education Program is to make available to qualified persons the opportunity to prepare for participation in care of patients of all ages, in various states of dependency, and with a variety of illness conditions.

Students are selected on the basis of demonstrated aptitude for nursing as determined by pre-entrance tests, interviews with faculty members, high school record, character references, and reports of medical and dental examination.

Throughout the one-year program the student is expected to grow continuously in acquisition of knowledge and understandings related to nursing, the biological sciences, the social sciences and in skills related to nursing practice, communications, interpersonal relations, and use of good judgment. Evaluation of student performance consists of tests on all phases of course content, evaluation of clinical performance, and evaluation of adjustment to the responsibilities of nursing. A passing score is required on all graded work, plus demonstrated progress in application of nursing skills to actual patient care.

Graduates of accredited programs of practical nurse education are eligible to take the licensing examination given by the North Carolina Board of Nursing. This examination is given twice each year, usually in April and September. A passing score entitles the individual to receive a license and to use a legal title "Licensed Practical Nurse." The license must be renewed annually. The Licensed Practical Nurse can apply for licensure in other states on the basis of a satisfactory examination score, without repeating the examination.

The LPN is prepared to function in a variety of situations: hospitals of all types, nursing homes, clinics, doctors' and dentists' offices and, in some localities, public health facilities. In all situations the LPN functions under supervision of a registered nurse and/or licensed physician. This supervision may be minimal in situations where the patient's condition is stable and not complex; or it may consist of continuous direction in situations requiring the knowledge and skills of the registered nurse or physician. In the latter situation, the LPN may function in an assisting role in order to avoid assuming responsibility beyond that for which the one-year program can prepare the individual.

Job requirements for the Licensed Practical Nurse include suitable personal characteristics, ability to adapt knowledge and understandings of nursing principles to a variety of situations, technical skills for performance of bedside nursing, appreciation for differences of people and for the worth of every individual, a desire to serve and help others, and readiness to conform to the requirements of nursing ethics and hospital policies.

PRACTICAL NURSE EDUCATION

CURRICULUM BY QUARTERS

Course Title	Hours Per Week			Quarter Hours
FIRST QUARTER	Class	Lab.	Clinic	Credit
Practical Nursing I	18	2	3	20
SECOND QUARTER				
Practical Nursing II	12	2	21	20
THIRD QUARTER				
Practical Nursing III	10	2	24	19
FOURTH QUARTER				
Practical Nursing IV	10	2	24	19

See pages 111-113 for brief description of courses.

RADIO AND TELEVISION SERVICING

Within recent years improved electronic techniques have provided expanded entertainment and educational facilities in the form of monochrome and color television, frequency-modulated radio, high-fidelity amplifiers and stereophonic-sound equipment. These developments require expanded knowledge and skill of the individual who would qualify as a competent and up-to-date serviceman.

This curriculum provides a training program which includes the basic knowledge and skills involved in the installation, maintenance and servicing of radio, television and sound-amplifier systems. A large portion of time is spent in the laboratory verifying electronic principles and developing servicing techniques.

A radio and television serviceman may be required to install, maintain and service amplitude-modulated and frequency-modulated home and auto radios, transistorized radios, monochrome and color television sets, intercommunication, public address and paging systems, high-fidelity and stereophonic amplifier, record players and tape recorders.

His work will require meeting the public both in the repair shop and on service calls. A serviceman who establishes his own business will also need to know how to maintain business records and inventory.

RADIO AND TELEVISION SERVICING

CURRICULUM BY QUARTERS

Course Title			Hrs. Per Week		Quarter Hours
FIRST QUARTER			**Class**	**Lab.**	**Credit**
MAT	1115	Electrical Mathematics	5	0	5
ENG	1101	Reading Improvement	2	0	2
ELC	1112	Direct & Alternating Current	5	13	9
			12	13	16
SECOND QUARTER					
MAT	1116	Electrical Mathematics	5	0	5
ENG	1102	Communication Skills	2	0	2
ELN	1122	Vacuum Tubes & Circuits	4	9	7
ELN	1123	Amplifier Systems	2	3	3
			13	12	17
THIRD QUARTER					
ELN	1125	Radio Receiver Servicing	2	6	4
ELN	1126	Transistor Theory & Circuits	3	12	7
PSY	1101	Human Relations	2	0	2
			7	18	13
FOURTH QUARTER					
ELN	1127	Tele. Receiver Circuits & Servicing	10	12	14
BUS	1103	Small Business Operations	3	0	3
			13	12	17

See pages 113-115 for brief description of courses.

WELDING

This curriculum was developed to fill the tremendous need for welders in North Carolina. The recently completed Manpower Survey shows quite clearly that many welders will be needed annually to fill present and projected vacancies in the State.

The content of this curriculum is designed to give students sound understanding of the principles, methods, techniques and skills essential for successful employment in the welding field and metals industry.

The field of welding offers a person prestige, security and a future of continuous employment with steady advancement. It offers employment in practically any industry: shipbuilding, automotive, aircraft, guided missiles, railroads, construction, pipe-fitting, production shop, job shop and many others.

Welders join metals by applying intense heat, and sometimes pressure, to melt the edges to form a permanent bond. Closely related to welding is "oxygen cutting." Of the more than 35 different ways of welding metals, arc, gas, and resistance welding are the three most important.

The principal duty of the welder using manual techniques is to control the melting by directing the heat from either an electric arc or gas welding torch, and to add filler metal where necessary to complete the joint. He should possess a great deal of manipulative skill with a knowledge of jigs, welding symbols, mathematics, basic metallurgy, and blueprint reading.

WELDING

CURRICULUM BY QUARTERS

Course Title			Hrs. Per Week		Quarter Hours
FIRST QUARTER			Class	Lab.	Credit
WLD	1120	Oxyacetylene Welding and Cutting	3	12	7
MAT	1101	Fundamentals of Mathematics	5	0	5
DFT	1104	Blueprint Reading: Mechanical	0	2	1
PHY	1101	Applied Science	3	0	3
			11	14	16
SECOND QUARTER					
WLD	1121	Arc Welding	3	12	7
MAT	1103	Geometry	3	0	3
DFT	1117	Blueprint Reading: Welding	0	2	1
PHY	1102	Applied Science	3	0	3
ENG	1102	Communication Skills	2	0	2
			11	14	16
THIRD QUARTER					
BUS	110.3	SMALL BUSINESS MANAGEMENT	2	0	2
WLD	1124	Pipe Welding	3	9	6
WLD	1123	Inert Gas Welding	0	3	1
~~WLD~~	~~1112~~	~~Mechanical Testing and Inspection~~	~~1~~	~~3~~	~~2~~
DFT	1118	Pattern Development and Sketching	1	3	2
PSY	1101	Human Relations	2	0	2
ENG	1101	READING IMPROVEMENT	2	0	2
			~~7~~ 10	~~18~~ 15	~~13~~ 15
FOURTH QUARTER					
WLD	1122	Commercial and Industrial Practices	3	6	5
WLD	1125	Certification Practices	3	3	4
MEC	1112	Machine Shop Processes	1	6	3
BUS	1105	Industrial Organizations	3	0	3
			10	15	15

See pages 115-117 for brief description of courses.

EXTENSION & GENERAL ADULT EDUCATION DIVISION

EXTENSION DIVISION

The Cape Fear Technical Institute provides training in numerous subjects through its Extension programs. Extension classes are held both at the school and at various locations throughout New Hanover, Brunswick and Pender Counties. These classes are designed to prepare individuals for employment or to upgrade workers already employed.

The extension department also serves area industries and public agencies by providing training for their employees. Training under this division of the Institute can be offered at any time a need for such training is established. Full details can be obtained by contacting the Director of Extension programs at the school.

Admission Requirements

Generally speaking any individual who is 18 years of age or whose high school class has graduated is eligible for admission to extension classes; applicants are usually admitted on the first come, first served basis. Some classes may have specific admission requirements, in such cases the Director of Extension programs will inform applicants of these requirements.

Expenses

Many of the extension classes are offered without charge to the students; in other cases a small fee is charged to cover the cost of instructional supplies. Any charges should be paid at the first class session.

Certificates

The Extension Division issues certificates to those who complete a course satisfactorily.

EXAMPLES OF EXTENSION PROGRAMS OFFERED

Air Conditioning & Refrigeration
Aircraft Assembly
Auto Mechanics
Auto Electricity
Basic Electronics
Blueprint Reading
Commercial Fishing
Crab Processing
Electricity
Electronic Circuits
Furniture Upholstery
Instrumentation
Janitorial Maintenance
Loom Fixing
Machine Shop Practice
Marine Diesel Mechanics
Metal Burning
Net-Making & Mending
Power Sewing
Slide Rule
Small Engine Repair
Supervisory Development Courses
Tailoring
Tourist Serving Training
Waitress Training

AGRICULTURAL

Farm Records
Fertilizers and Lime
Pesticides
Welding for Farmers
Ornamental Horticulture

BUSINESS

Typing
Bookkeeping
Shorthand

CONSTRUCTION

Bricklaying
Carpentry
Housewiring
Plumbing

PUBLIC AGENCIES

Fire Training
Fire Officer Training
Fire First Aid
Nurses' Aide
Orderlies Training
Police Training
Teacher Aides

SUPERVISORY DEVELOPMENT

The Art of Motivating People
Effective Writing
Effective Speaking
Human Relations
Industrial First Aid
Effective Communications
Job Methods
Industrial Safety & Accident Prevention
Job Analysis Training
Work Measurement

This list, of course, is in no way comprehensive, but is offered as a general sample of extension-type courses. For further information on this division contact the Director of Extension Programs.

GENERAL ADULT EDUCATION

The General Adult Education division of the Cape Fear Technical Institute is primarily concerned with raising the educational level of adults and providing cultural improvement courses. The Institute is prepared to provide training at all educational levels from grade one (learning to read and write) up through high school equivalency. This training is provided through organized classes and through the school's Learning Laboratory.

HIGH SCHOOL EQUIVALENCY CERTIFICATE

The State of North Carolina, through the Department of Public Instruction permits adults to take the General Educational Development Tests, (generally referred to as "the High School Equivalency Examination") at test centers throughout the State. Persons who make satisfactory scores on all five sections of the test are issued the High School Equivalency Certificate by the Department of Public Instruction. This certificate is recognized by most industries, schools and government agencies as meeting their requirement for a high school education. An application for the test may be obtained from the office of any school superintendent. The charge to the applicant is $10.00.

The Institute provides training in the five areas covered by the examination both through organized classes and the Learning Laboratory.

ORGANIZED CLASSES

Classes in adult education are organized as follows:

Basic Education I — For those adults who have completed less than four grades of formal education.

Basic Education II — For those adults who stopped school in grades 5-8 or who have completed Basic Education I.

Secondary I — For those adults who stopped school in grades 9-10 or who have completed Basic Education II.

Secondary II — For those adults who stopped school in grades 11-12 or who have completed Secondary I.

The school's Learning Laboratory provides training for those who are not able to attend the organized classes. See the Learning Laboratory Section (page 64) for full details.

In addition to the organized classes at the basic and secondary education levels, the General Adult Division offers a large variety of courses both at the school and throughout the area it serves. The type and frequency of these offerings are determined by the demand and interest in a given area of study. A sampling of courses under this heading would include:

Law for the Layman
Homemaking — Sewing and Food Preparation
Driver Education for Adults
Remedial Mathematics for the Prospective College Student
Remedial English for the Prospective College Student
Modern Math for Parents
Conversational French
Conversational Spanish
Speed Reading and Reading Improvement
Creative Art
Creative Writing
Public Speaking
Citizenship Studies for Naturalization
Interior Decorating for Homemakers
First Aid
Auto Mechanics for Car Owners
Ceramic Arts and Crafts

Additional courses are offered as the demand becomes evident. Details of these and other courses may be obtained from the Director of General Adult Education.

Admission Requirements

Any adult who has a desire to raise his or her educational level and who is able to benefit from a course may enroll in the general adult classes.

Expenses

There is no charge for the Basic Education and only a small fee to cover the cost of instructional materials in the Secondary I and II classes. Charges for other general adult classes are determined by the length of the course and instructional materials needed.

LEARNING LABORATORY

The Cape Fear Technical Institute Learning Lab — A Brief Summary of What It Is

The Learning Laboratory program at the Cape Fear Technical Institute is designed to provide study opportunities in practically any field that might be of interest to residents of the New Hanover, Pender or Brunswick County area. Programmed study courses to meet the needs of the non-reader as well as the college graduate are available in the laboratory.

Persons interested in participating in the Learning Laboratory, after an initial interview, are provided study materials starting at a point in keeping with their achievement level and are able to progress from there. Students may elect study times adjusted to their own convenience and schedules in that the Laboratory will be in operation on a schedule adjusted to the needs of participants.

The Fundamentals Learning Laboratory system was designed by Dr. Edward T. Brown of the North Carolina Department of Curriculum Studies and Research. Labs are operated throughout the State under the North Carolina Department of Community Colleges in cooperation with the Community Colleges, Technical Institutes, and Industrial Education Centers. At the present time, there are thirty-two Learning Laboratories in operation over the State.

A "Learning Laboratory" is essentially an individual study situation, in which any person eighteen years of age or older may undertake most any level of Reading, English, Math, Social Studies, or Science that he desires. All of the material used in the lab is programmed; therefore, there is no need for a classroom teacher. In fact, Dr. Brown has attempted to remove all resemblances of a classroom from the Learning Lab.

Programmed material is designed in such a manner as to aid the student in learning information in small sequences called "Frames." Each frame requires an immediate response, and each response is immediately checked. If the student fails to learn, or learns incorrectly, the program makes the correction or re-teaches. In this manner the student progresses at his own rate; he neither has to wait for others to catch up nor slow down to someone else's rate.

The coordinator, the person in charge of the learning lab, has the responsibility of locating the level at which a student can proceed

to learn by himself, of formulating the sequence of programs the student will undertake to achieve his desired goal, and of administering the tests that will assure the student that he is approaching his goal.

Because there are no classes in the learning lab, there is no need for anyone to wait until the new quarter to enroll. Each student sets his own work sessions and attends the lab as many days each week and as many hours each day as he thinks he can attend regularly. There are no fees, and any adult can take as many courses as fit his needs.

The majority of students presently enrolled in learning labs are seeking to prepare themselves for the high school equivalency examination or to gain educational improvement of their own choosing. Some, however, are enrolled to upgrade themselves for a possible job promotion; while others are using the program for reinforcement in a technical institute curriculum or in their college work.

The stated purposes for the existence of the learning laboratories suggest that every effort should be made to meet the needs of those who are interested in participating in the program.

The following pages comprise a list of the courses presently offered in the learning lab with a brief description of each course. The initials "A.C.T.," found in parentheses at the end of each course description, represent the words "approximate completion time." It should be kept in mind that these figures are only estimates for the average student and that each student will function best at his own rate; and, therefore, it is impossible to determine the exact time necessary for an individual to complete any given course. New courses of study are added regularly.

Admission Requirements For Learning Laboratory

Any adult who has a desire to raise his or her educational level and who is able to benefit from study in the Learning Laboratory may enroll.

Expenses

There is no charge for study in the Learning Laboratory.

BUSINESS

Course **Description**

Business Mathematics—This is a series of four courses made up of the following:

1. Fundamentals of Business Mathematics.
2. Interest, Negotiable Instruments, and Payroll Mathematics.
3. Business Mathematics in Management Decisions.
4. Mathematics of Accounting and Finance. (A.C.T. complete—75 hours)

Basic Filing—A short course designed on the alphabetic system of filing. (A.C.T.)—15 hours)

Stenospeed—An "ABC" shorthand. Dictation is given on tape. (A.C.T.—45 hours)

Bookkeeping (Temac)—A basic course for the beginner, written on a high school level. (A.C.T.—20 hours)

The Accounting Process—A fundamental course in the principles of accounting. (A.C.T.—12 hours)

COMPUTER-RELATED PROGRAMS

Course **Description**

Introduction to Binary Arithmetic—Binary Arithmetic (base 2) is the math through which computers operate. (A.C.T.—4 hours)

Introduction to Transistors—Deals mainly with transistors related to the structure and function of computers. (A.C.T.—12 hours)

Basic Transistor Circuits—This course is based on an Auto-Instructional Teaching Text on Digital Computer Fundamentals developed by the Raytheon Company. (A.C.T.—12 hours)

Introduction to Electronic Data Processing—This is a basic course dealing with the why and how of computers. (A.C.T.—20 hours)

Required Cobol - 1961—This is an extensive course dealing with the language of computers. (A.C.T.—120 hours)

ENGLISH

Course **Description**

2200, 2600, 3200—A series comprising a complete grammar program that covers seventh grade through high school level. The student is placed in one of the three courses depending on what his need might be. (A.C.T. for each—45 hours)

Programmed English—A complete freshman college level grammar course. (A.C.T.—50 hours)

300 Commas—A short course in the proper use of commas. (A.C.T.—8 hours)

Lessons for Self-Instruction in Basic Skills—A series made up of short courses in areas that tend to give problems in grammar. The short courses include:

1. Capitalization.
2. Punctuation.
3. Sentence Patterns.
4. Verbs, Number, and Case. (A.C.T. for each course—5 hours)

Spelling—An elementary spelling course, including basic spelling rules and procedures for using the dictionary. (A.C.T.—25 hours)

Words—A basic course in vocabulary development, written on a junior high school level. (A.C.T.—15 hours)

Vocabulary Building—This course teaches the meaning and usage of prefixes, suffixes, stems, word families, and groups. (A.C.T.—8 hours)

Improving Your Written Communication—A course designed primarily to improve business-orientated correspondence. (A.C.T.—8 hours)

FOREIGN LANGUAGE

Course Description

Programmed French—A French reading and writing course, teaching an active vocabulary of over 1600 words and a passive vocabulary of 900 more words. (A.C.T.—90 hours)

Basic German—A basic reading course, carrying the student through most of the verb tenses. The phonetic vocabulary is taught on tape. (A.C.T.—50 hours)

Basic Spanish—An extensive course in reading and writing, with the phonetic vocabulary taught on tape. (A.C.T.—180 hours)

GENERAL INTEREST

Course Description

The Analysis of Behavior—A survey of terms and concepts applied in a study of animal behavior. (A.C.T.—12 hours)

Effective Letters—A course designed to improve the effectiveness of personal and business letters. (A.C.T.—15 hours)

The Fundamentals of Music—A basic course teaching the identification of notes, time, and keys. (A.C.T.—8 hours)

Reading and Evaluating Financial Reports—A general course written for the layman. (A.C.T.—6 hours)

Understanding Public Relations—A study of public relations as a management function. (A.C.T.—10 hours)

Your Study Skills—A simple approach to the problem of learning how to study. (A.C.T.—4 hours)

READING

COMPREHENSIVE READING

Course Description

Reading Laboratories—Programs designed to improve the student's ability to retain what he reads. Work is also done on vocabulary development and grammar usage with a resulting effect on spelling. This course covers all grade levels.

Reading for Understanding—A reading course designed to develop or redevelop concentration processes. This program is especially helpful to students who have been out of school for an extended length of time.

SPEED READING

Course Description

Craig Reading Program—A program using a student-controlled machine to increase reading rate and eye coordination. A workbook is also used to insure that comprehension does not suffer with the increase in speed.

Reading Accelerator—A program using a device that is placed over a workbook. A slide moves down the page at a rate established by the student.

MATHEMATICS

Course Description

Univox Arithmetic—This course is written at a very elementary level, with emphasis on the four basic operations. (A.C.T.—25 hours)

Multiplication and Division (T.M.I.)—This is an elementary course in the two basic operations mentioned (A.C.T.—20 hours)

A.S.M.D. (B.R.L.)—This is also a basic course in the four arithmetic operations, with one book devoted to each operation. (A.C.T.—8 hours per book)

Basic Math (Temac)—This is an extensive course in the basic math processes, fractions, percents, and decimals, with emphasis on both theory and application. (A.C.T.—150 hours)

Basic Math Measurement—This program works with the more common mathematical measurements, including those related to geometric figures. (A.C.T.—30 hours)

Seventh-Grade Mathematics—This program is much like the "Basic Math" course mentioned above, but it is written on a higher reading level. It also carries the student completely through high school general math. (A.C.T.—130 hours)

Fractions (Tutor Text)—This is a very thorough program in both the theory and application of fractions. It is written on a relatively-high reading level. (A.C.T.—12 hours)

Decimal Numbers (T.M.I.)—This is a two-volume, elementary program in decimal numbers. (A.C.T.—20 hours)

Computing Square Roots—This is a short, efficient method for teaching the theory and application of square roots. (A.C.T.—3 hours)

Introduction to Probability—This program supplies a simple method for learning an interesting subject. (A.C.T.—2 hours)

Lessons for Self-Instruction in Basic Skills—This is a series of short courses, including units on addition, subtraction, multiplication, and divison. Work is done with whole numbers, fractions, decimals, and percents. (A.C.T.—4 hours for each unit)

An Introduction to Verbal Problems in Algebra (Temac)—This is a basic, introductory course and requires only a basic understanding of algebra. (A.C.T.—20 hours)

Algebra I and Algebra II (Temac)—These are extensive programs parallel with the ones taught in the public schools. When a student completes these courses, he is prepared for college algebra. (A.C.T.—150 each)

Plane Geometry (Temac)—This is a very thorough program, requiring some background in algebra as a prerequisite. (A.C.T.—80 hours)

Solid Geometry (Temac)—A complete course requiring plane geometry as a prerequisite. (A.C.T.—50 hours)

Trigonometry (Temac)—A college-level trig course requiring a good background in algebra. (A.C.T.—80 hours)

Analytic Trigonometry (Temac)—A course using trig functions and the field of complex numbers. (A.C.T.—80 hours)

Introductory Calculus—This course goes into both differential and integral calculus. (A.C.T.—50 hours)

Practical Mathematics (Tutor Text)—A practical application of algebra is taught for business; technical, and laboratory situations, as well as for everyday use. (A.C.T.—15 hours)

The Arithmetic of Computers (Tutor Text)—A study of the number systems used in modern electronic computers. (A.C.T.—15 hours)

The Slide Rule (Tutor Text)—A thorough course on the mechanics of the slide rule as well as practical applications. It covers up to the log-log scales. A good foundation in math is needed for this course. (A.C.T.—15 hours)

Advance Slide Rule—A course specifically designed to be used with the log-log duplex trig, and log-log duplex decitrig slide rules. (A.C.T.—35 hours)

Logarithms—A short course dealing with four-place logarithms, antilogs, multiplication, division, raising to powers, finding roots, and problems involving all operations. (A.C.T.—6 hours)

Modern Mathematics for the Junior High School (Temac)—A four-volume course presenting the "new" or "modern" math on a junior high level. (A.C.T.—120 hours)

Modern Algebra (Temac)—A six-unit, modern approach to traditional algebra. (A.C.T.—150 hours)

SCIENCE

Course **Description**

Biology and Chemistry—A high school level science course covering the subjects in general terms. There are no actual laboratory experiments. (A.C.T.—40 hours)

Work and Machines—A high school level physics course. There are no actual experiments. (A.C.T.—20 hours)

Measurement, Meteorology, and Astronomy—A course offering the essentials in each area. (A.C.T.—40 hours)

Sound, Light, Electricity, and Communication—A course offering the essentials in each area mentioned. (A.C.T.—40 hours)

Physical Science Program—A series made up of the following units:

1. Mechanics.
2. Engines.
3. Astronomy.
4. Geology.
5. Meteorology.

(A.C.T.—8 hours each unit)

Vectors—A physics course requiring only a basic knowledge of algebra as a prerequisite. (A.C.T.—12 hours)

Principles of Chemistry—An extremely thorough, theory-oriented, freshman college level course. No lab work is involved. (A.C.T.—180 hours)

Physiological Psychology—A general course with a thorough study of the nervous system and its involvement in behavior. (A.C.T.—25 hours)

SOCIAL STUDIES

Course **Description**

Geography of the U.S. (Univox)—A short, elementary course used mostly with students who have reading difficulties. (A.C.T.—15 hours)

Geography of the U.S. (B.R.L.)—A complete course with extensive map study. (A.C.T.—40 hours)

Maps: How We Read Them—A short course using maps of the United States as examples. (A.C.T.—4 hours)

History of the United States—Covers general U.S. history from the early explorers through the present. (A.C.T.—20 hours)

Great Themes in U.S. History—A short, concise treatment of the nation's history as it occurred in themes. (A.C.T.—8 hours)

How a Bill Becomes a Law—A government-related course touching almost every phase of the process of a bill becoming a law and other congressional-related topics. (A.C.T.—15 hours)

The Constitution—A course dealing with the Constitution from its historical background to the most recent amendments. (A.C.T.—15 hours)

The American Economic Series—A series of courses including the following:

Book 1. The Free Enterprise System. (A.C.T.—10 hours)
Book 2. The Gross National Product. (A.C.T.—12 hours)
Book 3. Problems of Economic Stability and Growth. (A.C.T.—10 hours)
Book 4. The Federal Reserve System and its Effect on Money and Banking. (A.C.T.—10 hours)
Book 5. Taxes and Government Spending. (A.C.T.—10 hours)
Book 6. International Trade. (A.C.T.—8 hours)
Book 7. Capitalism, Communism, and Socialism. (A.C.T.—12 hours)

TECHNICAL

Course **Description**

Basic Electricity-Electronics—This is a basic course in electricity including a study of electrical circuits. It is written so that a person with a seventh grade education can readily understand it. (A.C.T.—25 hours)

Applied Electricity—This is a basic, industrial-related electricity course. (A.C.T.—25 hours)

Liquid Level Measurement—This is an industrial-related course, concentrating on the usage of page glasses and floats. (A.C.T.—3 hours)

Measurements—A course dealing with measurements involving installation and construction skills in industry. (A.C.T.—12 hours)

P.E.R.T.—Program Evaluation Review Technique. Developed by the U.S. Navy, it is a system for setting up a construction schedule in industry. (A.C.T. —6 hours)

Pipefitting—A course dealing with pipe and fitting identification as related to industry. (A.C.T.—12 hours)

Pressure and Its Measurement—This is a course designed to teach the techniques of pressure measurement in all phases of industrial environment. (A.C.T.—12 hours)

Plain Bearings—A study of journal, thrust, and guide bearings, tolerance, clearance, and the care of plain bearings. (A.C.T.—12 hours)

Reading Engineering Drawings—A general course in reading basic industrial drawings. (A.C.T.—12 hours)

Sheet Metal Layout—Instruction in the laying out of conical transition pieces, tangents and grids, sheet metal elbows and drip pans, and rectangular duct sections. (A.C.T.—12 hours)

BRIEF
COURSE DESCRIPTIONS

BUSINESS ADMINISTRATION

COURSE DESCRIPTIONS BY QUARTERS

FIRST QUARTER

T-Eng 101—Grammar: Designed to aid the student in the improvement of self-expression in grammar. The approach is functional with emphasis on grammar, diction, sentence structure, punctuation, and spelling. Intended to stimulate students in applying the basic principles of English grammar in their day-to-day situations in industry and social life.
Prerequisite: None

T-Bus 102—Typewriting: Introduction to the touch typewriting system with emphasis on correct techniques, mastery of the keyboard, simple business correspondence, tabulation, and manuscripts.
Prerequisite: None

T-Mat 110—Business Mathematics: This course stresses the fundamental operations and their application to business problems. Topics covered include payrolls, price marking, interest and discount, commission, taxes, and pertinent uses of mathematics in the field of business.
Prerequisite: None

T-Bus 101—Introduction to Business: A survey of the business world with particular attention devoted to the structure of the various types of business organization, methods of financing, internal organization, and management.
Prerequisite: None

T-Eco 102—Economics: The fundamental principles of economics including the institutions and practices by which people gain a livelihood. Included is a study of the laws of supply and demand and the principles bearing upon production, exchange, distribution, and consumption both in relation to the individual enterprise and to society at large.
Prerequisite: None

SECOND QUARTER

T-Eng 102—Composition: Designed to aid the student in the improvement of self-expression in business and technical composition. Emphasis is on the sentence, paragraph and whole composition.
Prerequisite: **T-Eng 101**

T-Bus 120—Accounting: Principles, techniques and tools of accounting, for understanding of the mechanics of accounting. Collecting, summarizing, analyzing, and reporting information about service and mercantile enterprises, to include practical application of the principles learned.
Prerequisite: **T-Mat 110**

T-Eco 104—Economics: Greater depth in principles of economics, including a penetration into the composition and pricing of national output, distribution of income, international trade and finance, and current economic problems.
Prerequisite: **T-Eco 102**

T-Bus 115—Business Law: A general course designed to acquaint the student with certain fundamentals and principles of business law, including contracts, negotiable instruments, and agencies.
Prerequisites: None

T-Bus 123—Business Finance: Financing of business units, as individuals, partnerships, corporations, and trusts. A detailed study is made of short-term, long-term, and consumer financing.
Prerequisite: None

THIRD QUARTER

T-Eng 103—Report Writing: The fundamentals of English are utilized as a background for the organization and techniques of modern report writing. Exercises in developing typical reports, using writing techniques and graphic devices are completed by the students. Practical application in the preparation of a full-length report is required of each student at the end of the term. This report must have to do with something in his chosen curriculum.
Prerequisite: T-Eng 102

T-Bus 124—Business Finance: Financing, federal, state, and local government and the ensuing effects upon the economy. Factors affecting supply of funds, monetary and credit policies.
Prerequisite: T-Bus 123

T-Bus 110—Office Machines: A general survey of the business and office machines. Students will receive training in techniques, processes, operation and application of the ten-key adding machines, full keyboard adding machines, and calculator.
Prerequisite: None

T-Bus 121—Accounting: Partnership and corporation accounting including a study of payrolls, federal and state taxes. Emphasis is placed on the recording, summarizing and interpreting data for management control rather than on bookkeeping skills. Accounting services are shown as they contribute to the recognition and solution of management problems.
Prerequisite: T-Bus 120

T-Bus 116—Business Law: Includes the study of laws pertaining to bailments, sales, riskbearing, partnership-corporation, mortgages, and property rights.
Prerequisite: T-Bus 115

FOURTH QUARTER

T-Eng 204—Oral Communication: A study of basic concepts and principles of oral communications to enable the student to communicate with others. Emphasis is placed on the speaker's attitude, improving diction, voice, and the application of particular techniques of theory to correct speaking habits and to produce effective oral presentation. Particular attention given to conducting meetings, conferences, and interviews.
Prerequisite: T-Eng 101

T-Bus 232—Sales Development: A study of retail, wholesale and specialty selling. Emphasis is placed upon mastering and applying the fundamentals of selling. Preparation for and execution of sales demonstrations required.
Prerequisite: None

T-Edp 104—Introduction to Data Processing Systems: Fundamental concepts and operational principles of data processing systems, as an aid in developing a basic knowledge of computers, prerequisite to the detail study of particular computer problems. This course is a prerequisite for all programming courses.
Prerequisite: None

T-Bus 239—Marketing: A general survey of the field of marketing, with a detailed study of the functions, policies, and institutions involved in the marketing process.
Prerequisite: None

FIFTH QUARTER

T-Eng 206—Business Communication: Develops skills in techniques in writing business communications. Emphasis is placed on writing action — getting sales letters and prospectuses. Business reports, summaries of business con-

ferences, letters involving credit, collections, adjustments, complaints, orders, acknowledgements, remittances, and inquiry.

Prerequisite: T-Eng 102

T-Bus 243—Advertising: The role of advertising in a free economy and its place in the media of mass communications. A study of advertising appeals; product and market research; selection of media; means of testing effectiveness of advertising. Theory and practice of writing advertising copy for various media.

Prerequisite: None

T-Bus 235—Business Management: Principles of business management including overview of major functions of management, such as planning, staffing, controlling, directing, and financing. Clarification of the decision-making function versus the operating function. Role of management in business — qualifications and requirements.

Prerequisite: None

SIXTH QUARTER:

T-Bus 229—Taxes: Application of federal and state taxes to various businesses and business conditions. A study of the following taxes: income, payroll, intangible, capital gain, sales and use, excise, and inheritance.

Prerequisite: T-Bus 121

T-Bus 272—Principles of Supervision: Introduces the basic responsibilities and duties of the supervisor and his relationship to superiors, subordinates, and associates. Emphasis on securing an effective work force and the role of the supervisor. Methods of supervision are stressed.

Prerequisite: None

T-Bus 271—Office Management: Presents the fundamental principles of office management. Emphasis on the role of office management including its functions, office automation, planning, controlling, organizing and actuating office problems.

Prerequisite: None

ELECTIVES

BUSINESS ADMINISTRATION

T-Bus 247—Business Insurance: A presentation of the basic principles of risk insurance and their application. A survey of the various types of insurance is included.

Prerequisite: None

T-Bus 219—Credit Procedures and Problems: Principles and practices in the extension of credit; collection procedures; laws pertaining to credit extension and collection are included.

Prerequisite: T-Bus 120

T-Bus 255—Interpreting Accounting Records: Designed to aid the student in developing a "use understanding" of accounting records, reports and financial statements. Interpretation, analysis, and utilization of accounting statements.

Prerequisite: T-Bus 121

T-Bus 233—Personnel Management: Principles of organization and management of personnel, procurement, placement, training, performance checking, supervision, remuneration, labor relations, fringe benefits and security.

Prerequisite: None

T-Bus 245—Retailing: A study of the role of retailing in the economy including development of present retail structure, functions performed, principles governing effective operation and managerial problems resulting from current economic and social trends.
Prerequisite: None

T-Bus 237—Wholesaling: The development of wholesaling; present day trend in the United States. A study of the functions of wholesaling.
Prerequisite: None

T-Bus 266—Budget and Record Keeping: The basic principles, methods, and procedures for preparation and operation of budgets. Special attention is given to the involvement of individual departments and the role they play. Emphasis on the necessity for accurate record keeping in order to evaluate the effectiveness of budget planning.
Prerequisite: T-Bus 121

T-Bus 217—Business Law: A study of the powers, policies, methods, and procedures used by the various federal, state and local administrative agencies in promoting and regulating business enterprises. It includes a consideration of the constitutional and statutory limitations on these bodies and judicial review of administrative action.
Prerequisite: T-Bus 116

SOCIAL SCIENCE

T-Ssc 201—Social Science: An integrated course in the social sciences, drawing from the fields of anthropology, psychology, history, and sociology.
Prerequisite: None

T-Ssc 202—Social Science: A further study of social sciences with emphasis on economics, political science, and social problems as they relate to the individual.
Prerequisite: T-Ssc 201

T-Psy 206—Applied Psychology: A study of the principles of psychology that will be of assistance in the understanding of inter-personal relations on the job. Motivation, feelings and emotions are considered with particular reference to on-the-job problems. Other topics investigated are: employee selection, supervision, job satisfaction, and industrial conflicts. Attention is also given to personal and group dynamics so that the student may learn to apply the principles of mental hygiene to his adjustment problems as a worker and a member of the general community.
Prerequisite: None

T-Ssc 206—American Institutions: A study of the effect of American social, economic, and political institutions upon the individual as a citizen and as a worker. The course dwells upon current local, national, and global problems viewed in the light of our political and economic heritage.
Prerequisite: None

T-Pol 201—United States Government: A study of government with emphasis on basic concepts, structure, powers, procedures and problems.
Prerequisite: None

CHEMICAL TECHNOLOGY

COURSE DESCRIPTIONS BY QUARTERS

FIRST QUARTER

T-Eng 101—Grammar: Designed to aid the student in the improvement of self-expression in grammar. The approach is functional with emphasis on grammar, diction, sentence structure, punctuation, and spelling. Intended to

stimulate students in applying the basic principles of English grammar in their day-to-day situations in industry and social life.
Prerequisite: None

T-Mat 101—Technical Mathematics: The real number system is developed as an extension of natural numbers. Number systems of various bases are introduced. Fundamental algebraic operations, the rectangular coordinate system, as well as fundamental trigonometric concepts and operations are introduced. The application of these principles to practical problems is stressed.
Prerequisite: Satisfactory evidence that admission requirements have been met.

T-Phy 101—Physics: Properties of Matter: A fundamental course covering several basic principles of physics. The divisions included are solids and their characteristics, liquids at rest and in motion, gas laws and applications. Laboratory experiments and specialized problems dealing with these topics are part of this course.
Prerequisite: None

T-Dft 101—Technical Drafting: The field of drafting is introduced as the student begins study of drawing principles and practices for print reading and describing objects in the graphic language. Basic skills and techniques of drafting included are: use of drafting equipment, lettering, freehand orthographic and pictorial sketching geometric construction, orthographic instrument drawing of principal views, and standards and practices of dimensioning. The principles of isometric, oblique, and perspective are introduced.
Prerequisite: None

T-Chm 111—General Chemistry: An introductory chemistry course involving chemical terminology, atomic structure, properties of some elements, and the function of the periodic table. Properties of compounds and mixtures are studied as are types of chemical reactions. Laboratory work consists of various inorganic reactions and preparations.
Prerequisite: None

SECOND QUARTER

T-Eng 102—Composition: Designed to aid the student in the improvement of self-expression in business and technical composition. Emphasis is on the sentence, paragraph and whole composition.
Prerequisite: T-Eng 101

T-Mat 102—Technical Mathematics: A continuation of T-Mat 101. Advanced algebraic and trigonometric topics including quadratics, logarithms, determinants, progressions, the binomial expansion, complex numbers, solution of oblique triangles and graphs of the trigonometric functions are studied in depth.
Prerequisite: T-Mat 101

T-Phy 102—Physics: Work, Energy, Power: Major areas covered in this course are work, energy, and power. Instruction includes such topics as statics, forces, center of gravity and dynamics. Units of measurement and their applications are a vital part of this course. A practical approach is used in teaching students the use of essential mathematical formulas.
Prerequisites: T-Mat 101, T-Phy 101

T-Dft 102—Technical Drafting: The application of orthographic projection principles to the more complex drafting problems, primary and secondary auxiliary views, simple and successive revolutions, and sections and conventions will be studied. Most important is the introduction of the graphical analysis of space problems. Problems of practical design elements involving points, lines, planes, and a combination of these elements shall be studied.

Dimensioning practices, approved by the American Standards Association will also be included. Introduction is given to intersections and developments of various types of geometrical objects.

Prerequisite: T-Dft 101

T-Chm 112—General Chemistry: A study of the properties of elements not covered in T-Chm 101 and a study in greater depth of the combining properties of the elements including equivalent weights. Laboratory work includes chemical reactions and an investigation of properties of solutions.

Prerequisite: T-Chm 111

THIRD QUARTER

T-Eng 103—Report Writing: The fundamentals of English are utilized as a background for the organization and techniques of modern report writing. Exercises in developing typical reports, using writing techniques and graphic devices are completed by the students. Practical application in the preparation of a full-length report is required of each student at the end of the term. This report must have to do with something in his chosen curriculum.

Prerequisite: T-Eng 102

T-Mat 103—Technical Mathematics: The fundamental concepts of analytical geometry, differential and integral calculus are introduced. Topics included are graphing techniques, geometric and algebraic interpretation of the derivative, differentials, rate of change, the integral and basic integration techniques. Applications of these concepts to practical situations are stressed.

Prerequisite: T-Mat 102

T-Phy 103—Physics: Electricity: Basic theories of electricity, methods of production, and transmission and transforming of electricity. Electron theory, electricity by chemical action, electricity by friction, electricity by magnetism, induction voltage, amperage, resistance, horsepower, wattage, and transformers are major parts of the course.

Prerequisites: T-Mat 101, T-Phy 101

T-Chm 121—Quantitative Chemical Analysis: Emphasis is placed on developing laboratory techniques employed in the volumetric analysis of acids and bases. The students will become thoroughly familiar with the principles and procedures of neutralization titration. Classroom work will emphasize the stoichiometeric calculations involved in interpreting the results of analysis. Laboratory work will consist of percentage analysis of selected substances.

Prerequisite: T-Chem 112

FOURTH QUARTER

T-Eng 204—Oral Communication: A study of basic concepts and principles of oral communications to enable the student to communicate with others. Emphasis is placed on the speaker's attitude, improving diction, voice, and the application of particular techniques of theory to correct speaking habits and to produce effective oral presentation. Particular attention given to conducting meetings, conferences, and interviews.

Prerequisite: T-Eng 101

T-Chm 222—Quantitative Chemical Analysis: The more complex types of quantitative analysis. Special emphasis on the theory of oxidation-reduction and gravimetric analysis. Instrumental analysis is introduced and use of modern analytical devices is stressed. The student will become familiar with the principles of redox reactions, ionization constants and pH of solutions. Stress is placed on the stoichiometric calculations of quantitative chemical analysis. Classroom work complements quantitative determinations in the laboratory.

Prerequisite: T-Chm 121

T-Chm 227—Physical Chemistry: Atomic theory, states of matter, chemical thermodynamics, molecular properties of solutions, equilibria, phase role, electrochemistry, kinetics, surface chemistry, and photochemistry constitute major areas of study.
Prerequisite: T-Chm 121

FIFTH QUARTER

T-Chm 231—Organic Chemistry: Nomenclature, structure, preparation, properties, and reactions of aliphatic organic compounds. Laboratory work emphasizes techniques.
Prerequisite: T-Chm 222

T-Chm 241—Industrial Chemical Analysis: An industrial laboratory situation is simulated. Principles and techniques learned in previous quarters are utilized in solution of problems common to local industry. It will be the responsibility of the instructor to determine and submit in outline form a program of suitable scope and sequence of topics which he will work out from consultation with his local advisory committee, representing the industry. This program must be approved by the administration and accepted by the appropriate State-level authority.
Prerequisites: T-Chm 222, T-Chm 227

SIXTH QUARTER

T-Chm 232—Organic Chemistry: The nomenclature, structure, preparation, properties, and reactions of aromatic organic compounds. Laboratory work emphasizes techniques and involves preparation and analysis of selected organic compounds.
Prerequisites: T-Chm 231, T-Chm 227

T-Chm 242—Industrial Chemical Analysis: An industrial laboratory situation is maintained and the emphasis on instrumentation is expanded. Problems of industrial quality control. Plant visitations.
Prerequisite: T-Chm 241

ELECTIVES

CHEMICAL TECHNOLOGY

T-Mec 116—Engineering Materials: Study and testing of the properties of ferrous and non-ferrous metals and plastics, load and strain measurements, behavior of materials under load, qualities other than strength and control of the properties of the materials.
Prerequisite: T-Phy 102

T-Mat 201—Technical Mathematics: A continuation of T-Mat 103. More advanced concepts of differentiation and integration are considered. Included are graphs and derivatives of the trigonometric functions, exponential and logarithmic differentiation and integration, advanced integration techniques, polar equations, parametric equations and Fourier series.
Prerequisite: T-Mat 103

T-Mat 219—Differential Equations: Methods of solving first-order and simple higher order ordinary differential equations and linear differential equations with constant coefficients; solution of differential equations by series; and numerical solutions of differential equations.
Prerequisite: T-Mat 201

T-Phy 104—Physics: Light and Sound: A survey of the concepts involving wave motion leads to a study of sound, its generation, transmission and detection. The principles of wave motion also serves as an introduction to a

study of light, illumination and the principles involved in optical instruments. Application is stressed throughout.
Prerequisites: T-Mat 101, T-Phy 102

T-Phy 231—Fluid Mechanics: Fundamental laws of fluid flow and application of these laws to the sizing of hot and cold water piping, steam piping, refrigerant piping, air ducts, pumps, and fans. Particular emphasis will be directed to calculations of capacity, horsepower, and head requirements of pumps and fans; to comparison of the several methods of piping and air duct sizing; and to methods of fluid flow measurement.
Prerequisites: T-Mat 103, T-Phy 102

SOCIAL SCIENCE

T-Ssc 201—Social Science I: An integrated course in the social sciences, drawing from the fields of anthropology, psychology, history, and sociology.
Prerequisite: None

T-Ssc 202—Social Science II: A further study of social sciences with emphasis on economics, political science, and social problems as they relate to the individual.
Prerequisite: T-Ssc 201

T-Psy 206—Applied Psychology: A study of the principles of psychology that will be of assistance in the understanding of inter-personal relations on the job. Motivation, feelings and emotions are considered with particular reference to on-the-job problems. Other topics investigated are: employee selection, supervision, job satisfaction, and industrial conflicts. Attention is also given to personal and group dynamics so that the student may learn to apply the principle of mental hygiene to his adjustment problems as a worker and a member of the general community.
Prerequisite: None

T-Eco 102—Economics: The fundamental principles of economics including the institutions and practices by which people gain a livelihood. Included is a study of the laws of supply and demand and the principles bearing upon production, exchange, distribution, and consumption both in relation to the individual enterprise and to society at large.
Prerequisite: None

T-Ssc 205—American Institutions: A study of the effect of American social, economic, and political institutions upon the individual as a citizen and as a worker. The course dwells upon current, local, national, and global problems viewed in the light of our political and economic heritage.
Prerequisite: None

T-Pol 201—United States Government: A study of government with emphasis on basic concepts, structure, powers, procedures and problems.
Prerequisite: None

T-Isc 201—Industrial Organization and Management: Organizational structure for industrial management; operational and financial activities, including accounting, budgeting, banking, credit and industrial risk, forecasting of markets, selection and layout of physical facilities; selection, training and supervision of personnel as found in typical industrial organizations.
Prerequisite: None

DRAFTING & DESIGN — MECHANICAL

COURSE DESCRIPTIONS BY QUARTERS

FIRST QUARTER

T-Eng 101—Grammar: Designed to aid the student in the improvement of self-expression in grammar. The approach is functional with emphasis on grammar, diction, sentence structure, punctuation, and spelling. Intended to

stimulate students in applying the basic principles of English grammar in their day-to-day situations in industry and social life.
Prerequisite: None

T-Mat 101—Technical Mathematics: The real number system is developed as an extension of natural numbers. Number systems of various bases are introduced. Fundamental algebraic operations, the rectangular coordinate system, as well as fundamental trigonometric concepts and operations are introduced. The application of these principles to practical problems is stressed.
Prerequisite: Satisfactory evidence that admission requirements have been met.

T-Phy 101—Physics: Properties of Matter: A fundamental course covering several basic principles of physics. The divisions included are solids and their characteristics, liquids at rest and in motion, gas laws and applications. Laboratory experiments and specialized problems dealing with these topics are part of this course.
Prerequisite: None

T-Dft 101—Technical Drafting: The field of drafting is introduced as the student begins study of drawing principles and practices for print reading and describing objects in the graphic language. Basic skills and techniques of drafting included are: use of drafting equipment, lettering, freehand othographic and pictorial sketching, geometric construction, orthographic instrument drawing of principal views, and standards and practices of dimensioning. The principles of isometric, oblique, and perspective are introduced.
Prerequisite: None

T-Mec 101—Machine Processes: An introductory course designed to acquaint the student with basic hand tools, safety procedures and machine processes of modern industry. It will include a study of measuring instruments, characteristics of metals and cutting tools. The student will become familiar with the lathe family of machine tools by performing selected operations such as turning, facing, threading, drilling, boring, and reaming.
Prerequisite: None

SECOND QUARTER

T-Eng 102—Composition: Designed to aid the student in the improvement of self-expression in business and technical composition. Emphasis is on the sentence, paragraph and whole composition.
Prerequisite: T-Eng 101

T-Mat 102—Technical Mathematics: A continuation of T-Mat 101. Advanced algebraic and trigonometric topics including quadratics, logarithms, determinants, progressions, the binomial expansion, complex numbers, solution of oblique triangles and graphs of the trigonometric functions are studied in depth.
Prerequisite: T-Mat 101

T-Phy 102—Physics: Work, Energy, Power: The major areas covered in this course are work, energy, and power. Instruction includes such topics as statics, forces, center of gravity, and dynamics. Units of measurement and their applications are a vital part of this course. A practical approach is used in teaching students the use of essential mathematical formulas.
Prerequisites: T-Phy 101, T-Mat 101

T-Dft 102—Technical Drafting: The application of orthographic projection principles to the more complex drafting problems, primary and secondary auxiliary views, simple and successive revolutions, and sections and conventions will be studied. Most important is the introduction of the graphical analysis of space problems. Problems of practical design elements involving points, lines, planes, and a combination of these elements shall be studied. Dimensioning practices for "details" and "working drawings," approved by the American

Standards Association will also be included. Introduction is given to intersections and developments of various types of geometrical objects.
Prerequisite: T-Dft 101

T-Mec 102—Machine Processes: Advanced operations on lathe, drilling, boring and reaming machines. Milling machine theory and practice. Thorough study of the types of milling machines, cutters, jig and fixture devices, and the accessories used in a modern industrial plant. Safety in the operational shop is stressed.
Prerequisite: T-Mec 101

THIRD QUARTER

T-Eng 103—Report Writing: The fundamentals of English are utilized as a background for the organization and techniques of modern report writing. Exercises in developing typical reports, using writing techniques and graphic devices are completed by the students. Practical application in the preparation of a full-length report is required of each student at the end of the term. This report must have to do with something in his chosen curriculum.
Prerequisite: T-Eng 102

T-Mat 103—Technical Mathematics: The fundamental concepts of analytical geometry, differential and integral calculus are introduced. Topics are graphing techniques, geometric and algebraic interpretation of the derivative, differentials, rate of change, the integral and basic integration techniques. Applications of these concepts to practical situations are stressed.
Prerequisite: T-Mat 102

T-Phy 103—Physics: Electricity: Basic theories of electricity, types of electricity, methods of production, and transmission and transforming of electricity. Electron theory, electricity by chemical action, electricity by friction, electricity by magnetism, induction voltage, amperage, resistance, horsepower, wattage, and transformers are major parts of the course.
Prerequisites: T-Phy 101, T-Mat 101

T-Phy 106—Applied Mechanics: Concepts and principles of statics and dynamics. Parallel concurrent and noncurrent force systems in coplanar and noncoplanar situations. Concepts of centroids and center of gravity, moments of inertia, fundamentals of kinetics, and kinematics of velocity and motion.
Prerequisites: T-Mat 103, T-Phy 102

T-Dft 103—Technical Drafting: Intersection and developments and their practical solutions. Where applicable, model solutions accompany the problems. The various techniques employed to produce and render isometric and oblique drawings, isometric, dimetric and trimetric projections, will be included.
Prerequisite: T-Dft 102

FOURTH QUARTER

T-Eng 204—Oral Communication: A study of basic concepts and principles of oral communications to enable the student to communicate with others. Emphasis is placed on the speaker's attitude, improving diction, voice, and the application of particular techniques of theory to correct speaking habits and to produce effective oral presentation. Particular attention given to conducting meetings, conferences, and interviews.
Prerequisite: T-Eng 101

T-Dft 201—Technical Drafting: Applications and constructions of charts, graphs, and nomographs in engineering and technical data. Screw threads, springs, keys, rivets, piping, and welding symbols, methods of representing and specifying will be covered. Basic mechanisms of motion transfer, gears and cams, will be studied and drawn with emphasis on methods of specifying, calculating, dimensions, and delineating.
Prerequisite: T-Dft 103

T-Dft 204—Descriptive Geometry: Graphic analysis of space problems involving points, lines, planes, connectors, and a combination of these. Practical design problems will be stressed with analytical verification where applicable. Visualization shall be stressed on every problem.
Prerequisites: T-Dft 102, T-Mat 102

T-Mec 205—Strength of Materials: Study of principles and analysis of stresses which occur within machine and structure elements subjected to various types of loads such as static, impact, varying and dynamic. Analyses of these stresses are made as applied to thin-walled cylinders and spheres, riveted and welded joints, beams, columns and machine components.
Prerequisites: T-Phy 106, T-Mat 103

T-Mec 210—Physical Metallurgy: Introductory course in metallurgy, a basic study of the properties of metals and alloys. Analysis of the structure of metals and alloys, atomic structure, nuclear structure, and nuclear reactions. Solid (crystalline) structures, methods of designating crystal planes; liquid and vapor phases; phase diagrams; and alloy systems.
Prerequisite: T-Phy 101

FIFTH QUARTER

T-Dft 205—Design Drafting I: Basic design is introduced in the study of motion transfer mechanisms as they relate to power trains. Principles of design sketching, design drawing, layout drafting, detailing from layouts, production drawings and simplified drafting practices constitute areas of study. Types and methods of specifying materials and workmanship are an integral part of the course.
Prerequisites: T-Dft 204, T-Mat 102, T-Phy 102

T-Dft 211—Mechanisms: Mathematical and drafting room solutions of problems involving the principles of machine elements. Study of motions of linkages, velocities and acceleration of points within a link mechanism; layout methods for designing cams, belts, pulleys, gears and gear trains.
Prerequisites: T-Dft 201 & 204, T-Mat 103, T-Phy 106

T-Mec 211—Physical Metallurgy: Properties of metals and alloys, the reactions of metals, diffusion, carburizing, metal bonding and homogenization; recrystallization and grain growth, age hardening, nitriding, internal oxidation; heat treatment of steel; laboratory experiments and demonstrations.
Prerequisite: T-Mec 210

SIXTH QUARTER

T-Dft 206—Design Drafting II: Research to solve a problem in design by consulting various manuals, periodicals, and through laboratory experiments. A written technical report, preliminary design sketches, layout drawings, detail drawings, assembly and sub-assembly drawings, pictorial drawings, exploded pictorial assembly, patent drawings and specifications are required as a part of the problem.
Prerequisites: T-Dft 205, T-Dft 210

T-Mec 235—Hydraulics and Pneumatics: The basic theories of hydraulic and pneumatic systems. Combinations of systems in various circuits. Basic designs and functions of circuits and motors, controls, electrohydraulic servomechanisms, plumbing, filtration, accumulators and reservoirs.
Prerequisite: T-Phy 102

ELECTIVES

T-Dft 212—Jig and Fixture Design: Commercial standards, principles, practices and tools of jig and fixture design. Individual project and design work to acquaint students with the types of jigs and fixtures and their design.
Prerequisites: T-Dft 205, T-Dft 211

T-Eln 201—Industrial Controls: Industrial controls is the study of modern methods of controlling machinery by electronic circuitry. Machinery controls and electronic mechanisms that automatically operate machines will be studied. Types of motors, generators, control signals and devices, thyratrons, gates, switches, and servomechanism circuits are major areas of study.
Prerequisite: T-Phy 103

T-Elc 201—Electrical Machinery: A course in basic understanding and application of electricity to modern industrial machinery. Included is a study of direct current motors, motor controls and protecting devices, transformers, and the industrial applications of this equipment.
Prerequisite: T-Phy 103

T-Mec 237—Control Systems: Hydraulic, pneumatic, mechanical, electrical and electronic control systems and components. Basic description, analysis and explanation of operation. Typical performance characteristics, limitations on performance, accuracy, applications and their utilization in industrial processes.
Prerequisites: T-Phy 103, T-Phy 205

T-Isc 201—Industrial Organization and Management: Organizational structure for industrial management; operational and financial activities, including accounting, budgeting, banking, credit and industrial risk, forecasting of markets, selection and layout of physical facilities; selection, training and supervision of personnel as found in typical industrial organizations.
Prerequisite: None

SOCIAL SCIENCE

T-Ssc 201—Social Science I: An integrated course in the social sciences, drawing from the fields of anthropology, psychology, history, and sociology.
Prerequisite: None

T-Ssc 202—Social Science II: A further study of social sciences with emphasis on economics, political science, and social problems as they relate to the individual.
Prerequisite: T-Ssc 201

T-Psy 206—Applied Psychology: A study of the principles of psychology that will be of assistance in the understanding of inter-personal relations on the job. Motivation, feelings and emotions are considered with particular reference to on-the-job problems. Other topics investigated are: employee selection, supervision, job satisfaction, and industrial conflicts. Attention is also given to personal and group dynamics so that the student may learn to apply the principles of mental hygiene to his adjustment problems as a worker and a member of the general community.
Prerequisite: None

T-Eco 102—Economics: The fundamental principles of economics including the institutions and practices by which people gain a livelihood. Included is a study of the laws of supply and demand and the principles bearing upon production, exchange, distribution, and consumption both in relation to the individual enterprise and to society at large.
Prerequisite: None

T-Ssc 205—American Institutions: A study of the effect of American social, economic, and political institutions upon the individual as a citizen and as a worker. The course dwells upon current local, national, and global problems viewed in the light of our political and economic heritage.
Prerequisite: None

T-Pol 201—United States Government: A study of government with emphasis on basic concepts, structure, powers, procedures and problems.
Prerequisite: None

ELECTRONICS TECHNOLOGY

COURSE DESCRIPTIONS BY QUARTERS

FIRST QUARTER

T-Eng 101—Grammar: Designed to aid the student in the improvement of self-expression in grammar. The approach is functional with emphasis on grammar, diction, sentence structure, punctuation, and spelling. Intended to stimulate students in applying the basic principles of English grammar in their day-to-day situations in industry and social life.
Prerequisite: None

T-Mat 101—Technical Mathematics: The real number system is developed as an extension of natural numbers. Number systems of various bases are introduced. Fundamental algebraic operations, the rectangular coordinate system, as well as fundamental trigonometric concepts and operations are introduced. The application of these principles to practical problems is stressed.
Prerequisite: Satisfactory evidence that admission requirements have been met.

T-Phy 101—Physics: Properties of Matter: A fundamental course covering several basic principles of physics. The divisions included are solids and their characteristics, liquids at rest and in motion, gas laws and applications. Laboratory experiments and specialized problems dealing with these topics are part of this course.
Prerequisite: None

T-Dft 101—Technical Drafting: The field of drafting is introduced as the student begins study of drawing principles and practices for print reading and describing objects in the graphic language. Basic skills and techniques of drafting included are: use of drafting equipment, lettering, freehand orthographic and pictorial sketching, geometric construction, orthographic instrument drawing of principal views, and standards and practices of dimensioning. The principles of isometric, oblique, and perspective are introduced.
Prerequisite: None

T-Elc 101—Fundamentals of Electricity: Elementary principles of electricity including: basic electric units, Ohms law, Kirchhoffs law, network theorems, magnetics, basic electrical measuring instruments, inductance, capicitance, sine wave analysis, and non-resonant resistive, inductive and capacitive networks.
Prerequisite: None

SECOND QUARTER

T-Eng 102—Composition: Designed to aid the student in the improvement of self-expression in business and technical composition. Emphasis is on the sentence, paragraph and whole composition.
Prerequisite: T-Eng 101

T-Mat 102—Technical Mathematics: A continuation of T-Mat 101. Advance algebraic and trigonometric topics including quadratics, logarithms, determinants, progressions, the binominal expansion, complex numbers, solution of oblique triangles and graphs of the trigonometric functions are studied in depth.
Prerequisite: T-Mat 101

T-Phy 102—Physics: Work, Energy, Power: Major areas covered in this course are work, energy, ad power. Instruction includes such topics as statics, forces, center of gravity and dynamics. Units of measurement and their applications are a vital part of this course. A practical approach is used in teaching students the use of essential mathematical formulas.
Prerequisites: T-Mat 101, T-Phy 101

T-Dft 102—Technical Drafting: The application of orthographic projection principles to the more complex drafting problems, primary and secondary auxiliary views, simple and successive revolutions, and sections and conventions will be studied. Most important is the introduction of the graphical analysis of space problems. Problems of practical design elements involving points, lines, planes, and a combination of these elements shall be studied. Dimensioning practices for "details" and "working drawings," approved by the American Standard Association will also be included. Introduction is given to intersections and developments of various types of geometrical objects.

Prerequisite: T-Dft 101

T-Elc 102—Fundamentals of Electricity: Series and parallel resonant-circuit analysis, resonant and non-resonant transformer analysis, basic diode power supply analysis, introduction to non-linear resistive control devices, and introduction to electromechanical devices.

Prerequisite: T-Elc 101

THIRD QUARTER

T-Eng 103—Report Writing: The fundamentals of English are utilized as a background for the organization and techniques of modern report writing. Exercises in developing typical reports, using writing techniques and graphic devices are completed by the students. Practical application in the preparation of a full-length report is required of each student at the end of the term. This report must have to do with something in his chosen curriculum.

Prerequisite: T-Eng 102

T-Mat 103—Technical Mathematics: The fundamental concepts of analytical geometry, differential and integral calculus are introduced. Topics included are graphing techniques, geometric and algebraic interpretation of the derivative, differentials, rate of change, the integral and basic integration techniques. Applications of these concepts to practical situations are stressed.

Prerequisite: T-Mat 102

T-Eln 101—Electronic Instruments and Measurements: A study of basic electronic instruments, their theory of operation, function, tolerances, and calibration. Both service and laboratory instruments will be studied. Laboratory experience will provide application of each type instrument studied.

Prerequisite: T-Elc 102

T-Eln 105—Control Devices: A study in depth of the electrical characteristics of vacuum tubes and transistors. Basic parameters and applications of each type device to the three configurations of a three-terminal two-port system will be included.

Prerequisite: T-Elc 102

FOURTH QUARTER

T-Eng 204—Oral Communication: A study of basic concepts and principles of oral communications to enable the student to communicate with others. Emphasis is placed on the speaker's attitude, improving diction, voice, and the application of particular techniques of theory to correct speaking habits and to produce effective oral presentation. Particular attention given to conducting meetings, conferences and interviews.

Prerequisite: T-Eng 101

T-Mat 201—Technical Mathematics: A continuation of T-Mat 103. More advanced concepts of differentiation and integration are considered. Included are graphs and derivatives of the trigonometric functions, exponential and logarithmic differentiation and integration, advanced integration techniques, polar equations, parametric equations and Fourier series.

Prerequisite: T-Mat 103

T-Phy 104—Physics: Light and Sound: A survey of the concepts involving wave motion leads to a study of sound, its generation, transmission and detection. The principles of wave motion also serve as an introduction to a study of light, illumination and the principles involved in optical instruments. Application is stressed throughout.

Prerequisites: T-Mat 101, T-Phy 101

T-Eln 205—Applications of Vacuum Tubes and Transistors: Practical applications of vacuum tubes and transistors to basic audio amplifiers, radio frequency amplifiers, detectors, modulators and oscillators.

Prerequisite: T-Eln 105

FIFTH QUARTER

T-Eln 210—Semiconductor Circuit Analysis: A study in some depth of the analysis and design of transistor circuits. Network theorems and equivalent circuits are used extensively in evaluating total circuit performance. Device peculiarities and limitations pertinent to reliable operations are considered. H.Y.Z. and T. parameters are employed as well as signal-flow graphs.

Prerequisite: T-Eln 105

T-Eln 214—Wave Shaping and Pulse Circuits: Broadband amplifiers, magnetic amplifiers, multivibrators, wave shaping techniques, chopper amplifiers, clipper and clamper circuits.

Prerequisites: T-Eln 105, T-Mat 103

T-Eln 229—Electronics Project: Project selection to be approved by Instructor.

SIXTH QUARTER

T-Eln 215—Wave Shaping and Pulse Circuits: Pulse techniques, diode switches, gates, step-counters, restorers and other specific circuits which function as switches.

Prerequisite: T-Eln 214

T-Eln 220—Electronic Systems: A block diagram course investigating numerous electronic systems. Modules or blocks of various circuits already studied are arranged in various manners to produce complex electronic systems. Systems will be explained and reduced to functions and then to block diagrams. AM, FM, and Single Sideband transmitters and receivers, multiplexing, TV transmitters and receivers, pulse-modulated systems, computers, telemetry, navigational systems, sonar and radar will be considered.

Corequisite: T-Eln 215

T-Eln 230—Electronics Project: Continuation of project T-Eln 229.

ELECTIVES

T-Eln 225—Transmission and Propagation: An introduction to the electromagnetic radiation, principles of antenna, radiation patterns and field strength. The characteristics and use of transmission lines in radio frequency application. Factors involved in propagation, ground waves, reflections, sky waves, atmospheric effects, ionosphere, fading, noise, static, wire radiators, directive gain, effect of ground, impedence, antenna systems and arrays.

Prerequisite: T-Eln 105

Corequisite: T-Eln 205

T-Eln 227—UHF and Microwave Systems: A study of UHF and VHF components, circuits, and measurement techniques. The use of distributed constant elements, waveguides and coaxial cables, microwave links, high-frequency oscillators, magnetrons, klystrons, traveling wave tubes. An introduction to the use of the Smith Chart.

Prerequisite: T-Eln 225

T-Eln 230—Television Systems: A study of the principles of television including the television system, camera tubes, scanning and synchronization,

composite video signal, receiver circuits, transmitting equipment, color television, and closed-loop systems.

Corequisite: T-Eln 214

T-Eln 235—Industrial Instrumentation: Broad introduction to use of industrial electro-mechanical and electronic circuits and equipment. Provides an understanding of the methods, techniques, and skills required for installation, service and operation of a variety of industrial control systems. Analysis of sensing devices for detecting changes in pressure, temperature, humidity, sound, light, electricity, the associated circuitry and indicating and recording devices.

Prerequisites: T-Eln 205, T-Phy 104

T-Eln 240—Digital Computers: An exploration into the methodology of counting and computing. Various computer techniques will be investigated including: non-sinusoidal waveforms, binary and decade counters, industrial counters, readout devices, logic circuits, arithmetic circuits, storage devices, input-output devices, computer control, analog and digital converters.

Prerequisite: T-Eln 214

T-Eln 245—Electronic Design Project: Students are required to design and construct a project approved by the instructor. Includes selection of project, design, construction, and testing of completed project. Projects may include: AM or FM transmitters or receivers, amplifiers, test equipment, control devices, simple counters, lasers, masers, etc.

Prerequisite: T-Eln 205

T-Elc 210—Rotating Devices: Introduction to electrical machinery. AC and DC motor and generator principles, synchros and servomechanisms, alternators and dynamotors, Ward-Leonard and amplifyne control systems will be analyzed. A general knowledge of the theory, operation, and maintenance of these devices and systems will be stressed.

Prerequisites: T-Elc 102, T-Phy 102

T-Chm 101—Chemistry: Study of the physical and chemical properties of substances, chemical changes; elements, compounds, gases, chemical combinations; weights and measurements; theory of metals; acids, bases, salts, solvents, solutions, and emulsions. In addition, study of carbohydrates; electrochemistry, electrolytes, and electrolysis in their application of chemistry to industry.

Prerequisite: T-Mat 101

T-Edp 104—Introduction to Electronic Data Processing Systems: A study of the fundamental concepts and operational principles of data processing system. They are presented as an aid in developing a basic knowledge of computers as a prerequisite to the detail study of a particular system. This course also provides a general knowledge of computing systems and is a prerequisite for all programming courses.

Prerequisite: None

T-Mat 208—Calculus and Laplace Transforms for Electronics: An investigation of the methods of calculus which are of the most direct use in the study of electronic circuits. Introduction to selected topics from differential equations and Laplace transforms and applications of these methods to the solution of electronic circuit problems.

Prerequisite: T-Mat 201

Corequisite: T-Eln 214

T-Mec 110—Fundamental Mechanisms: A study of the purpose and actions of cams, cables, gear trains, differentials, screws, belts, pulleys, shafts, levers, and other mechanical devices used to transmit or control signals.

Prerequisite: T-Phy 102

SOCIAL SCIENCE

T-Ssc 201—Social Science: An integrated course in the social sciences, drawing from the fields of anthropology, psychology, history, and sociology.

Prerequisite: None

T-Ssc 202—Social Science: A further study of social sciences with emphasis on economics, political science, and social problems as they relate to the individual.

Prerequisite: T-Ssc 201

T-Psy 206—Applied Psychology: A study of the principles of psychology that will be of assistance in the understanding of inter-personal relations on the job. Motivation, feelings, and emotions are considered with particular reference to on-the-job problems. Other topics investigated are: employee selection, supervision, job satisfaction, and industrial conflicts. Attention is also given to personal and group dynamics so that the student may learn to apply the principles of mental hygiene to his adjustment problems as a worker and a member of the general community.

Prerequisite: None

T-Eco 102—Economics: The fundamental principles of economics including the institutions and practices by which people gain a livelihood. Included is a study of the law of supply and demand and the principles bearing upon production, exchange, distribution, and consumption both in relation to the individual enterprise and to society at large.

Prerequisite: None

T-Ssc 205—American Institutions: A study of the effect of American social, economic, and political institutions upon the individual as a citizen and as a worker. The course dwells upon current local, national, and global problems viewed in the light of our political and economic heritage.

Prerequisite: None

T-Pol 201—United States Government: A study of government with emphasis on basic concepts, structure, powers, procedures and problems.

Prerequisite: None

INSTRUMENTATION TECHNOLOGY

BRIEF DESCRIPTION OF COURSES

FIRST QUARTER

T-Phy 101—Physics (Properties of Matter): A fundamental course covering several basic principles of physics. The divisions included are solids and their characteristics, liquids at rest and in motion, gas laws and applications. Laboratory experiments and specialized problems dealing with these topics are part of this course.

Prerequisite: None

T-Mat 101—Technical Mathematics: The real number system is developed as an extension of natural numbers. Number systems of various bases are introduced. Fundamental algebraic operations, the rectangular coordinate system, as well as fundamental trigonometric concepts and operations are introduced. The application of these principles to practical problems is stressed.

Prerequisite: Satisfactory evidence that admission requirements have been met.

T-Elc 101—Fundamentals of Electricity: Elementary principles of electricity including: Basic electric units, Ohms law, Kirchhoffs law, network theorems,

magnetics, basic electrical measuring instruments, inductance, capacitance, sine wave analysis, and non-resonant resistive inductive and capacitive networks.
Prerequisite: None

T-Eng 101—Grammar: Designed to aid the student in the improvement of self-expression in grammar. The approach is functional with emphasis on grammar, diction, sentence structure, punctuation and spelling. Intended to stimulate students in applying the basic principles of English grammar in their day-to-day situations in industry and social life.
Prerequisite: None

T-Mea 101—Measuring Principles: Covers various process variables and energy measuring elements both mechanical and electrical. Includes studying the more common sensing devices and components employed for the measure of temperature pressure flow, and related phenomena.
Prerequisite: None

SECOND QUARTER

T-Elc 102—Fundamentals of Electricity: Series and parallel resonant-circuit analysis, resonant and non-resonant transformer analysis, basic diode power supply analysis, introduction to non-linear resistive control devices, and introduction to electromechanical devices.
Prerequisite: T-Elc 101

T-Phy 102—Physics (Work, Energy, Power): Major areas covered in this course are work, energy, and power. Instruction includes such topics as statics, forces, center of gravity and dynamics. Units of measurement and their applications are a vital part of this course. A practical approach is used in teaching students the use of essential mathematical formulas.
Prerequisite: T-Mat 101, T-Phy 101

T-Mat 102—Technical Mathematics: A continuation of T-Mat 101. Advance algebraic and trigonometric topics including quadratics, logarithms, determinants, progressions, the binominal expansion, complex numbers, solution of oblique triangles and graphs of the trigonometric functions are studied in depth.
Prerequisite: T-Mat 101

T-Ins 101—Instrument Shop Practice: Fundamentals of process instrument systems. Calibration of pneumatic, and electrical instruments presented concurrently with measuring and control.
Prerequisite: T-Mea 101

T-Mea 102—Measuring and Control: A study of measurement of various energy levels related to Industrial Processes. An introduction to automated control fundamentals using the controller actions: On-Off control, proportional control, proportional plus reset control, or proportional plus reset and rate control. Also trouble shooting methods will be covered.
Prerequisite: T-Mea 101

THIRD QUARTER

T-Eng 103—Report Writing: The fundamentals of English are utilized as a background for the organization and techniques of modern report writing. Exercises in developing typical reports, using writing techniques and graphic devices are completed by the students. Practical application in the preparation of a full-length report is required of each student at the end of the term. This report must have to do with something in his chosen curriculum.
Prerequisite: T-Eng 101

T-Mat 103—Technical Mathematics: A continuation of T-Mat 101. Advanced algebraic and trigonometric topics including quadratics, logarithms, determi-

nants, progressions, the binominal expansion, complex numbers, solution of oblique triangles and graphs of the tigonometric functions are studied in depth.
Prerequisite: T-Mat 101

T-Dft 101—Technical Drafting: The field of drafting is introduced as the student begins study of drawing principles and practices for print reading and describing objects in the graphic language. Basic skills and techniques of drafting included are: use of drafting equipment, lettering, freehand orthographic and pictorial sketching, geometric construction, orthographic instrument drawing of principal views, and standards and practices of dimensioning. The principles of isometric, oblique, and prespective are introduced.
Prerequisite: None

T-Mea 103—Measuring and Control: More advanced applications of measuring and control devices. Also includes a more detailed study of control actions. Recording devices are also studied with an introduction to the principles of Data Logging.
Prerequisite: T-Mea 102

FOURTH QUARTER

T-Mat 201—Technical Mathematics: A continuation of T-Mat 103. More advanced concepts of differentiation and integration are considered. Included are graphs and derivatives of the trigonometric functions, exponential and logarithmic differentiation and integration, advanced integration techniques, polar equations, papametric equations and Fourier series.
Prerequisite: T-Mat 103

T-Eng 204—Oral Communication: A study of basic concepts and principles of oral communications to enable the student to communicate with others. Emphasis is placed on the speaker's attitude, improving diction, voice and the application of particular techniques of theory to correct speaking habits and to produce effective oral presentation. Particular attention given to conducting meetings, conferences, and interviews.
Prerequisite: T-Eng 101

T-Eln 101—Electronic Instruments and Measurements: A study of basic electronic instruments, their theory of operation, function, tolerances, and calibration. Both service and laboratory instruments will be studied. Laboratory experience will provide application of each type instrument studied.
Prerequisite: T-Elc 102

T-Phy 211—Physical and Chemical Analysis: A study of the measurement and control of the physical and chemical properties of the materials which are being processed and go to make up the final products. Examples: Density and specific gravity, viscosity, consistency, pH, conductivity, combustibility, etc.
Prerequisite: T-Mea 103

FIFTH QUARTER

T-Eln 210—Semiconductor Circuit Analysis: A study in some depth of the analysis and design of transistor circuits. Network theorems and equivalent circuits are used extensively in evaluating total circuit performance. Device peculiarities and limitations pertinent to reliable operations are considered. H.Y.Z. and T. parameters are employed as well as signal flow graphs.
Prerequisite: T-Mea 102

T-Eln 216—Control Principles and Telemetry: A course in which the process being controlled is considered as a major element in any control system. Studied are the effects of resistance, capacitance, and transportation lag or dead time upon a control system. Pneumatic, hydraulic, and electrical controllers are studied.
Prerequisite: T-Mea 103

T-Eln 217—Calibration and Standardization: Course to illustrate the philosophy of measurement and control, emphasizing the meaning of validity, sensitivity and control devices, units of measurement, and levels of accuracy and trace ability.
Prerequisite: T-Mea 103

T-Eod 202—General and Industrial Economics: A study of general economic principles, and an analysis of the factors involved. Course also includes the importance of cost control to an industrial enterprise.
Prerequisite: None

T-Eln 218—Electronics for Instrumentation: A study of the application of basic electronic principles in devices such as transducers, recorders, analytical instruments, data storage and retrieval apparatus, and consideration of the various means for utilizing frequency as analogy of some variable.
Prerequisite: T-Mea 102

SIXTH QUARTER

T-Eln 226—Control System Analysis: A study of the response of systems to instrument control based upon consideration of the system components. Negative and positive feedback along with the implications of closed loop control are covered.
Prerequisite: T-Phy 211

T-Eln 227—Computer Principles and Systems: This course employs virtually all previous courses as it familiarizes the student with both analog and digital computers for measurement, comparison logging, and control. Numerical control is an integral part of the course.
Prerequisite: T-Mea 103

T-Eln 228—Instrumentation Project: A laboratory project to promote individual initiative and project responsibility. It involves a review of major concepts in previous courses. The student will have maximum opportunity to develop, evaluate, and carry his project to a successful conclusion.
Prerequisite: T-Mea 103

T-Isc 201—Industrial Organization and Management: Organizational structure for industrial management; operational and financial activities, including accounting, budgeting, banking, credit and industrial risk, forecasting of markets, selection and layout of physical facilities; selection, training and supervision of personnel as found in typical industrial organizations.
Prerequisite: None

MARINE TECHNOLOGY

COURSE DESCRIPTION BY QUARTERS

FIRST QUARTER (FALL)

T-Eng 101—Grammar: Designed to aid the student in the improvement of self-expression in grammar. The approach is functional with emphasis on grammar diction, sentence structure, punctuation, and spelling. Intended to stimulate students in applying the basic principles of English grammar in their day-to-day situations in industry and social life.
Prerequisite: Satisfactory evidence that admission requirements have been met.

T-Mat 101—Technical Mathematics: The real number system is developed as an extension of natural numbers. Number systems of various bases are introduced. Fundamental algebraic operations, the rectangular coordinate system,

as well as fundamental trigonometric concepts and operations are introduced. The application of these principles to practical problems is stressed.

Prerequisite: Satisfactory evidence that admission requirements have been met.

T-Msc 101—Navigation and Seamanship: Theory of navigation with a comprehensive study of the compass, compass error and its applications, various types of charts, plotting, piloting, navigation aids, buoys, lights, rules of the road, basic electronic navigation, Mercator and Great Circle sailing. Theory and practical application of shipboard procedures and seamanship.

Prerequisite: None

T-Pme 101—Internal Combustion Engines and Aux. Equipment: The principles of operation of 2-cycle and 4-cycle internal combustion marine engines. Testing of engine performance, servicing and maintenance of pistons, valves, cams, camshafts, fuel and exhaust systems, cooling systems, proper lubrication, and methods of testing, diagnosing, and repairing. Emphasis will be given to the proper maintenance and preservation of marine engines.

Prerequisite: None

Basic marine diesel principles and components, their applications and relationships. Fundamental principles involved in transformation of heat energy to mechanical energy. Theory of fuels, exhaust systems, injectors, pumps, combustion and pre-combustion chambers, and air induction systems. Laboratory practices will be directed to the proper maintenance, operation, and safety factors of the marine diesel engine.

Prerequisite: None

SECOND QUARTER (WINTER)

T-Eng 102—Composition: Designed to aid the student in the improvement of self-expression in business and technical composition. Emphasis is on the sentence, paragraph and whole composition.

Prerequisite: **T-Eng 101**

T-Mat 102—Technical Mathematics: A continuation of **T-Mat 101**. Advanced algebraic and trigonometric topics including quadratics, logarithms, determinants, progressions, the binomial expansion, complex numbers, solution of oblique triangles and graphs of the trigonometric functions are studied in depth.

Prerequisite: **T-Mat 101**

T-Msc 102—Navigation and Seamanship: Practical problems in piloting including danger angles, soundings and effects of tides and currents. An introduction to celestial navigation covering topics, such as celestial equator system of coordinates, navigational triangle, lines of position, observed altitudes, and adjusting the compass. Laboratory exercises and experience will be given on aids to navigation including radar, radio direction finders, sonar echo ranging, depth recorders, gyro compass, etc. Shipboard procedures and practical seamanship will be stressed.

Prerequisite: **T-Msc 101**

T-Pme 102—Internal Combustion Engine and Aux. Equipment: A comprehensive study of marine auxiliary equipment, such as pumps, winches, compressors, generators, anchor windless, electrical steering apparatus, etc. Laboratory and shop practices in the repair and operation of ship's mechanical devices, engine room and generator room logs and records, and preventative maintenance procedures on all equipment.

Prerequisite: **T-Pme 101**

THIRD QUARTER (SPRING)

T-Mat 103—Technical Mathematics: The fundamentals concepts of analytical geometry, differential and integral calculus are introduced. Topics included are graphing techniques, geometric and algebraic interpretation of the deriva-

tive, differentials, rate of change, the integral and basic integration techniques. Applications of these concepts to practical situations are stressed.
Prerequisite: T-Mat 102

T-Phy 101—Physics (Properties of Matter): A fundamental course covering several basic principles of physics. The divisions included are solids and their characteristics, liquids at rest and in motion, gas laws and applications. Laboratory experiments and specialized problems dealing with these topics are part of this course.
Prerequisite: None

T-Bio 110—Biology (General): A general review of the basic principles in biology that would pertain to the study of Marine Biology.
Prerequisite: None

T-Msc 103—Navigation and Seamanship. Advanced theory and practice involving celestial navigation, elementary meteorology, storm tracking, winds, air pressure, and weather instruments. Laboratory exercises in navigation problems with additional work assigned in shipboard procedures, sanitation, and practical seamanship.
Prerequisite: T-Msc 102

FOURTH QUARTER (SUMMER)

T-Phy 102—Physics (Work, Energy, Power): Major areas covered in this course are work, energy, and power. Instruction includes such topics as statics, forces, center of gravity and dynamics. Units of measurement and their applications are a vital part of this course. A practical approach is used in teaching students the use of essential mathematical formulas.
Prerequisite: T-Mat 101, T-Phy 101

T-Chm 101—Chemistry: Study of the physical and chemical properties of substances; chemical changes; elements, compounds, gases, chemical combination; weights and measurements; theory of metals; acids, bases, salts, solvents, solutions, and emulsions. In addition, study of carbohydrates; electrochemistry, electrolytes, and electrolysis in their application of chemistry to industry.
Prerequisite: None

T-Msc 104—Navigation and Seamanship: Continuation of advanced theory and practice involving celestial navigation, elementary meteorology, storm tracking, winds, air pressure, and weather instruments. Laboratory exercises in navigation problems with additional work assigned in shipboard procedures, sanitation, and practical seamanship.
Prerequisite: T-Msc 103

FIFTH QUARTER (FALL)

T-Eng 103—Report Writing: The fundamentals of English are utilized as a background for the organization and techniques of modern report writing. Exercises in developing typical reports, using writing techniques and graphic devices are completed by the students. Practical application in the preparation of a full-length report is required of each student at the end of the term. This report must have to do with something in his chosen curriculum.
Prerequisite: None

T-Msc 207—Introduction to Oceanography: The meaning and potentiality of oceanography; historical aspects; geological features of the oceans; interrelations between land and sea. General physical and chemical properties of sea water and their relationships to living organisms. Instruments and equipments used in the study of oceanography.
Prerequisite: None

T-Phy 103—Physics (Electricity): Basic theories of electricity, types of electricity, methods of production, and transmission and transforming of electricity. Electron theory, electricity by chemical action, electricity by friction, electricity by magnetism, induction voltage, amperage, resistance, horsepower, wattage, and transformers are major parts of the course.

Prerequisite: T-Mat 101, T-Phy 101 and T-Phy 102

SIXTH QUARTER (WINTER)

T-Eng 204—Oral Communications: A study of basic concepts and principles of oral communications to enable the student to communicate with others. Emphasis is placed on the speaker's attitude, improving diction, voice, and the application of particular techniques of theory to correct speaking habits and to produce effective oral presentation. Particular attention given to conducting meetings, conferences, and interviews.

T-Bio 121—Marine Biology: Survey of marine animals and plants and their interrelationships including food chain, predation, parasitism and sybiosis. Study of morphology, identification and classification of marine organisms in North Carolina waters. General understanding of life cycles, population changes and distribution as influenced by environmental factors. Proper procedures of collecting samples of living organisms using plankton samplers, corers, dredges, and nets.

Prerequisite: T-Bio 110

T-Eln 132—Shipboard Electronic Equipment: A study of the function and operation of shipboard electrical and electronic equipment used for navigation, communication, oceanography, and fishery operations.

Prerequisite: None

T-Msc 208—Oceanography (Physical): Physical properties of sea water—temperature, pressure, viscosity and light. Broad features of oceanic circulation, currents, upwelling, tides and interaction of air and ocean. Use of various oceanographic instruments such as current meter, bathythermograph, reversing thermometer, water samplers (Nansen and Knudsen), etc.

Prerequisite: T-Msc 207

SEVENTH QUARTER (SPRING)

T-Msc 209—Oceanography (Chemical): Chemical nature of sea water—inorganic and organic substances; distribution of salinity. Techniques and instruments used in, the chemical analysis of sea water; salinometer, pH meter, oxygen analysis; spectuphotometer; nuclear training system, etc.

Prerequisite: T-Msc 208

T-Msc 211—Fishing Operations: A study of the many types of devices and nets involved in the capture, transportation, and preservation of marine food animals. Laboratory exercises, lectures, and demonstrations will include schematics and rigging of the otto trawl. Fabrication of bottom dredges, construction of fish traps; long lining for swordfish and tuna. Students will be given an introduction to the fishfinder, yankee trawling, and the manufacture and use of various types of fishing buoys.

Prerequisite: None

T-Psy 211—Basic Statistics (Binomial Distribution): Point and interval estimates; chi-squares; frequency distribution; ratios, rates and percentages. Normal distribution: mean and standard deviation; interval estimates; t-distribution; coefficient of variation.

Prerequisite: None

EIGHTH QUARTER (SUMMER)

T-Ahr 206—Marine Refrigeration: A basic study of essential refrigeration terminology; laws of refrigeration; heat and methods of transfer; the compression system; compressors, refrigerants and their characteristics; pressure—temperature relationships; conventional, hermetic, and absorption system of refrigeration; and special shipboard refrigeration systems.
Prerequisite: None

T-Msc 204—Cartography: The techniques of producing boat sheets and plotting sheets for use in navigation and oceanography. Students will develop and produce various charts utilizing gnomonic, Mercator, Great Circle, anthographic and topographical projections. Laboratory exercises will be assigned in the use of the maneuvering board involving problems of navigation.
Prerequisite: T-Msc 207

T-Msc 213—Marine Fishery Science: Study of life histories and distribution of marine fishes, with emphasis on commercial species. Description of fisheries; fishing methods, and gears; preservation methods.
Prerequisite: T-Bio 121

T-Msc 212—Fishing Operations: A study of the technique of capturing porgies, herring, mullet, tuna, shrimps, and menhaden. Field trips will be used to demonstrate modern methods employed in the bailing and pumping of the catch at sea and at the plant. A portion of this course will be devoted to the sport fishing industry and will include a study of the equipment as well as the methods and procedures used in the location, capture, and preservation of animals pertinent to the industry.
Prerequisite: T-Msc 211

SECRETARIAL — ENGINEERING AND TECHNICAL

COURSE DESCRIPTIONS BY QUARTERS

FIRST QUARTER

T-Eng 101—Grammar: Designed to aid the student in the improvement of self-expression in grammar. The approach is functional with emphasis on grammar, diction, sentence structure, punctuation, and spelling. Intended to stimulate students in applying the basic principles of English grammar in their day-to-day situations in industry and social life.
Prerequisite: None

T-Bus 102—Typewriting: Introduction to the touch typewriting system with emphasis on correct techniques, mastery of the keyboard, simple business correspondence, tabulation, and manuscripts.
Prerequisite: None

T-Mat 110—Business Mathematics: This course stresses the fundamental operations and their application to business problems. Topics covered include payrolls, price marking, interest and discount, commission, taxes, and pertinent uses of mathematics in the field of business.
Prerequisite: None

T-Bus 101—Introduction to Business: A survey of the business world with particular attention devoted to the structure of the various types of business organization, methods of financing, internal organization, and management.
Prerequisite: None

T-Bus 106—Shorthand: A beginning course in the theory and practice of

reading and writing shorthand. Emphasis on phonetics, penmanship, word families, brief forms, and phrases.
Prerequisite: None

SECOND QUARTER

T-Eng 102—Composition: Designed to aid the student in the improvement of self-expression in business and technical composition. Emphasis is on the sentence, paragraph and whole composition.
Prerequisite: T-Eng 101

T-Bus 103—Typewriting: Instruction emphasizes the development of speed and accuracy with further mastery of correct typewriting techniques. These skills and techniques are applied in tabulation, manuscript, correspondence, and business forms.
Prerequisite: T-Bus 102 or the equivalent. Speed requirement, 30 words per minute for five minutes.

T-Bus 107—Shorthand: Continued study of theory with greater emphasis on dictation and elementary transcription.
Prerequisite: T-Bus 106 or the equivalent

T-Bus 120—Accounting: Principles, techniques and tools of accounting, for understanding of the mechanics of accounting. Collecting, summarizing, analyzing, and reporting information about service and mercantile enterprises, to include practical application of the principles learned.
Prerequisite: T-Mat 110

T-Bus 115—Business Law: A general course designed to acquaint the student with certain fundamentals and principles of business law, including contracts, negotiable instruments, and agencies.
Prerequisite: None

THIRD QUARTER

T-Eng 103—Report Writing: The fundamentals of English are utilized as a background for the organization and techniques of modern report writing. Exercises in developing typical reports, using writing techniques and graphic devices are completed by the students. Practical application in the preparation of a full-length report is required of each student at the end of the term. This report must have to do with something in his chosen curriculum.
Prerequisite: T-Eng 102

T-Bus 104—Typewriting: Emphasis on production typing problems and speed building. Attention to the development of the student's ability to function as an expert typist, producing mailable copies. The production units are tabulation, manuscript, correspondence, and business forms.
Prerequisite: T-Bus 103 or the equivalent. Speed requirement, 40 words per minute for five minutes.

T-Bus 108—Shorthand: Theory and speed building. Introduction to office-style dictation. Emphasis on development of speed in dictation and accuracy in transcription.
Prerequisite: T-Bus 107

T-Bus 110—Office Machines: A general survey of the business and office machines. Students will receive training in techniques, processes, operation and application of the ten-key adding machines, full keyboard adding machines, and calculator.
Prerequisite: None

T-Bus 112—Filing: Fundamentals of indexing and filing, combining theory and practice by the use of miniature letters, filing boxes and guides. Alpha-

betic, Triple Check, Automatic, Geographic, Subject, Soundex, and Dewey Decimal filing.

Prerequisite: None

T-Bus 183T—Terminology and Vocabulary: To develop an understanding of the terminology and vocabulary appropriate to the course of study, as it is used in business, technical, and professional offices.

Prerequisite: T-Bus 107

FOURTH QUARTER

T-Eng 204—Oral Communication: A study of basic concepts and principles of oral communications to enable the student to communicate with others. Emphasis is placed on the speaker's attitude, improving diction, voice, and the application of particular techniques of theory to correct speaking habits and to produce effective oral presentation. Particular attention given to conducting meetings, conferences, and interviews.

Prerequisite: T-Eng 101

T-Bus 206T—Dictation and Transcription: Develops the skill of taking dictation and of transcribing at the typewriter materials appropriate to the course of study, which includes a review of the theory and the dictation of familiar and unfamiliar material at varying rates of speed. Minimum dictation rate of 100 words per minute required for five minutes on new material.

Prerequisite: T-Bus 108

T-Bus 205—Advanced Typewriting: Emphasis is placed on the development of individual production rates. The student learns the techniques needed in planning and in typing projects that closely approximate the work appropriate to the field of study. These projects include review of letter forms, methods of duplication, statistical tabulation, and the typing of reports, manuscripts and legal documents.

Prerequisite: T-Bus 104. Speed requirement, 50 words per minute for five minutes.

T-Bus 211—Office Machines: Instructions in the operation of the bookkeeping-accounting machines, duplicating equipment, and the dictating and transcribing machines.

Prerequisite: T-Bus 110

T-Edp 104—Introduction to Data Processing Systems: Fundamental concepts and operational principles of data processing systems, as an aid in developing a basic knowledge of computers, a prerequisite to the detail study of particular computer problems. This course is a prerequisite for all programming courses.

Prerequisite: None

FIFTH QUARTER

T-Eng 206—Business Communication: Develops skills in techniques in writing business communications. Emphasis is placed on writing action — getting sales letters and prospectuses. Business reports, summaries of business conferences, letters involving credit, collections, adjustments, complaints, orders, acknowledgments, remittances, and inquiry.

Prerequisite: T-Eng 102

T-Bus 207T—Dictation and Transcription: Covering materials appropriate to the course of study, the student develops the accuracy, speed, and vocabulary that will enable her to meet the stenographic requirements of business and professional offices. Minimum dictation rate of 110 words per minute required for five minutes on new material.

Prerequisite: T-Bus 206

T-Bus 214—Secretarial Procedures: Designed to acquaint the student with the responsibilities encountered by a secretary during the work day. These include the following: receptionist duties, handling the mail, telephone techniques, travel information, telegrams, office records, purchasing of supplies, office organization, and insurance claims.

Prerequisite: None

SIXTH QUARTER

T-Bus 208T—Dictation and Transcription: Principally a speed building course, covering materials appropriate to the course of study, with emphasis on speed as well as accuracy. Minimum dictation rate of 120 words per minute required for five minutes on new material.

Prerequisite: T-Bus 207

T-Bus 271—Office Management: Presents the fundamental principles of office management. Emphasis on the role of office management including its functions, office automation, planning, controlling, organizing and actuating office problems.

Prerequisite: None

T-Bus 272—Principles of Supervision: Introduces the basic responsibilities and duties of the supervisor and his relationship to superiors, subordinates, and associates. Emphasis on securing an effective work force and the role of the supervisor. Methods of supervision are stressed.

Prerequisite: None

ELECTIVES

T-Psy 112—Personality Development: Designed to help the student recognize the importance of the physical, intellectual, social, and emotional dimensions of personality. Emphasis is placed on grooming and methods of personality improvement.

Prerequisite: None

T-Bus 121—Accounting: Partnership and corporation accounting including a study of payrolls, federal and state taxes. Emphasis is placed on the recording, summarizing and interpreting data for management control rather than on bookkeeping skills. Accounting services are shown as they contribute to the recognition and solution of management problems.

Prerequisite: T-Bus 120

T-Eco 102—Economics: The fundamental principles of economics including the institutions and practices by which people gain a livelihood. Included is a study of the laws of supply and demand and the principles bearing upon production, exchange, distribution, and consumption both in relation to the individual enterprise and to society at large.

Prerequisite: None

T-Bus 215T—Office Application: During the sixth quarter only, students are assigned to work in a business, technical, or professional office for six hours per week. The objective is to provide actual work experience for secretarial students and an opportunity for the practical application of the skills and knowledge previously learned, according to the course of study.

Prerequisites: T-Bus 214, T- Bus 205, T-Bus 208, T-Bus 211

T-Eco 108—Consumer Economics: Designed to help the student use his resources of time, energy, and money to get the most out of life. It gives the student an opportunity to build useful skills in buying, managing his finances, increasing his resources, and to understand better the economy in which he lives.

Prerequisite: None

T-Bus 116—Business Law: Includes the study of laws pertaining to bailments, sales, risk-bearing, partnership-corporation, mortgages, and property rights.

Prerequisite: T-Bus 115

SOCIAL SCIENCE

T-Ssc 201—Social Science: An integrated course in the social sciences, drawing from the fields of anthropology, psychology, history and sociology.
Prerequisite: None

T-Ssc 202—Social Science: A further study of social sciences with emphasis on economics, political science, and social problems as they relate to the individual.
Prerequisite: T-Ssc 201

T-Psy 206—Applied Psychology: A study of the principles of psychology that will be of assistance in the understanding of inter-personal relations on the job. Motivation, feelings and emotions are considered with particular reference to on-the-job problems. Other topics investigated are: employee selection, supervision, job satisfaction, and industrial conflicts. Attention is also given to personal and group dynamics so that the student may learn to apply the principles of mental hygiene to his adjustment problems as a worker and a member of the general community.
Prerequisite: None

T-Ssc 205—American Institutions: A study of the effect of American social, economic, and political institutions upon the individual as a citizen and as a worker. The course dwells upon current local, national, and global problems viewed in the light of our political and economic heritage.
Prerequisite: None

T-Pol 201—United States Government: A study of government with emphasis on basic concepts, structure, powers, procedures and problems.
Prerequisite: None

AUTOMOTIVE MECHANICS

COURSE DESCRIPTIONS BY QUARTERS

FIRST QUARTER

Pme 1101—Internal Combustion Engine: Development of a thorough knowledge and ability in using, maintaining, and storing the various hand tools and measuring devices needed in engine repair work. Study of the construction and operation of components of internal combustion engines. Testing of engine performance servicing and maintenance of pistons, valves, cams and camshafts, fuel and exhaust systems, cooling systems; proper lubrication, and methods of testing, diagnosing and repairing.
Prerequisite: None

Mat 1101—Fundamentals of Mathematics: Practical number theory. Analysis of basic operations: addition, subtraction, multiplication and division. Fractions, decimals, powers and roots, percentages, ratio and proportion. Plane and solid geometric figures used in industry; measurement of surfaces and volumes. Introduction to algebra used in trades. Practice in depth.
Prerequisite: None

Eng 1101—Reading Improvement: Designed to improve the student's ability to read rapidly and accurately. Special machines are used for class drill to broaden the span of recognition, to increase eye coordination and word group recognition and to train for comprehension in larger units.
Prerequisite: None

Phy 1101—Applied Science: An introduction to physical principles and their application in industry. Topics in this course include measurement; properties of solids, liquids, and gases; basic electrical principles.
Prerequisite: None

SECOND QUARTER

Pme 1102—Engine Electrical and Fuel Systems: A thorough study of the electrical and fuel systems of the automobile. Battery cranking mechanism, generator, ignition, accessories and wiring; fuel pumps, carburetors, and fuel injectors. Characteristics of fuels, types of fuel systems, special tools, and testing equipment for the fuel and electrical system.
Prerequisite: Pme 1101

Eng 1102—Communication Skills: Designed to promote effective communication through correct language usage in speaking and writing.
Prerequisite: Eng 1101

Dft 1101—Schematics & Diagrams: Power Mechanics: Interpretation and reading of blueprints. Development of ability to read and interpret blueprints, charts, instruction and service manuals, and wiring diagrams. Information on the basic principles of lines, views, dimensioning procedures, and notes.
Prerequisite: None

Phy 1102—Applied Science: The second in a series of two courses of applied physical principles. Topics introduced in this course are heat and thermometry, and principles of force, motion, work, energy, and power.
Prerequisite: Phy 1101

THIRD QUARTER

Aut 1120—Automotive Analysis. Complete engine operation analysis through the use of electronic equipment. Students will be trained on the various electronic equipment to analyze exhaust fumes, etc. for proper trouble shooting diagnosis. Equipment used will be similar to that used by the Automotive Repair Garages. Students will learn the proper steps to be followed in trouble shooting analysis of an automotive engine, brakes, steering, elec. circuit, drive lines.

Aut 1123—Automotive Chassis and Suspension Systems: Principles and functions of the components of automotive chassis. Practical job instruction in adjusting and repairing of suspension, and steering systems. Units to be studied will be shock absorbers, springs, steering systems, steering linkage, and front end and alignment.
Prerequisite: Pme 1102

Aut 1121—Braking Systems: A complete study of various braking systems employed on automobiles and lightweight trucks. Emphasis is placed on how they operate, proper adjustment, and repair.
Prerequisite: Phy 1102

Psy 1101—Human Relations: A study of basic principles of human behavior. The problems of the individual are studied in relation to society, group membership, and relationships within the work situation.
Prerequisite: None

FOURTH QUARTER

Aut 1124—Automotive Power Train Systems: Principles and functions of automotive power train systems: clutches, transmission gears, torque converters, drive shaft assemblies, rear axles and differentials. Identification of troubles, servicing, and repair.
Prerequisites: Phy 1102, Aut 1123

Wld 1101—Basic Gas Welding: Welding demonstrations by the instructor and practice by students in the welding shop. Safe and correct methods of assembling and operating the welding equipment. Practice will be given for surface welding; bronze welding, silver-soldering, and flame-cutting methods applicable to mechanical repair work.
Prerequisite: None

Aut 1125—Automotive Servicing: Emphasis is on the shop procedures necessary in determining the nature of troubles developed in the various component systems of the automobile. Troubleshooting of automotive systems, providing a full range of experiences in testing, adjusting, repairing and replacing.
Prerequisites: Aut 1123, Aut 1121, Ahr 1101

Bus 1103—Small Business Operations: An introduction to the business world, problems of small business operation, basic business law, business forms and records, financial problems, ordering and inventorying, layout of equipment and offices, methods of improving business, and employer-employee relations.
Prerequisite: None

DRAFTING — MECHANICAL

COURSE DESCRIPTIONS BY QUARTERS

FIRST QUARTER

Dft 1121—Drafting: An introduction to drafting and the study of drafting practices. Instruction is given in the selection, use and care of instruments, singlestroke lettering, applied geometry, freehand sketching consisting of orthographic and pictorial drawings. Orthographic projection, reading and instrument drawing of principal views, single auxiliary views (primary), and double (oblique) auxiliary views will be emphasized. Dimensioning and note practices will be studied with reference to the American Standards Association practices. Methods of reproducing drawings will be included at the appropriate time.
Prerequisite: None

Mat 1101—Fundamentals of Mathematics: Practical number theory. Analysis of basic operations: addition, subtraction, multiplication and division. Fractions, decimals, powers and roots, percentages, ratio and proportion. Plane and solid geometric figures used in industry; measurement of surfaces and volumes. Introduction to algebra used in trades. Practice in depth.
Prerequisite: None

Eng 1101—Reading Improvement: Designed to improve the student's ability to read rapidly and accurately. Special machines are used for class drill to broaden the span of recognition, to increase eye coordination and word group recognition and to train for comprehension in larger units.
Prerequisite: None

Phy 1101—Applied Science: An introduction to physical principles and their application in industry. Topics in this course include measurement: properties of solids, liquids, and gases; basic electrical principles.
Prerequisite: None

SECOND QUARTER

Dft 1122—Drafting: The trainee will study simple and successive revolutions and their applications to practical problems. Sections and conventions will be studied and both detail and assembly sections will be drawn. Intersections and developments will be studied by relating the drawing to the sheet metal trades. Models of the assigned drawings will be made from construction paper, cardboard, or similar materials as a proof of the solution to the problems drawn. Methods of drawing and projecting axonometric, oblique, and perspective drawings will be studied with emphasis on the practical applications of pictorial drawings. Various methods of shading will be introduced and dimensioning and sectioning of oblique and axonometric pictorials will be done.
Prerequisite: Dft 1121

Dft 1125—Descriptive Geometry: Graphical analysis of space problems. The problems deal with practical design elements involving points, lines, planes, connectors, and a combination of these. Included are problems dealing with

solid geometry theorems. Where applicable, each graphical solution shall be accompanied by the analytical solution.

Prerequisite: Dft 1121

Mat 1103—Geometry: Fundamental properties and definitions; plane and solid geometric figures, selected general theorems, geometric construction of lines, angles and plane figures. Dihedral angles, areas of plane figures, volumes of solids. Geometric principles are applied to shop operations.

Eng 1102—Communication Skills: Designed to promote effective communication through correct language usage in speaking and writing.

Prerequisite: Eng 1101

Phy 1102—Applied Science: The second in a series of two courses of applied physical principles. Topics introduced in this course are heat and thermometry, and principles of force, motion, work, energy, and power.

Prerequisite: Phy 1101

THIRD QUARTER

Dft 1131—Mechanical Drafting: An introduction to mechanical drafting beginning with problems concerning precision and limit dimensioning. Methods of fastening materials, and fasteners: keys, rivets, springs, and welding. Symbols will be studied and drawings will be made involving these items. Principles of design will be introduced with the study of basic mechanisms of motion transfer; gears, cams, power trains, pulleys, belting and methods of specifying and calculating dimensions will be studied. Drawings will be made involving these mechanisms.

Prerequisite: Dft 1122

Mat 1104—Trigonometry: Trigonometric ratios; solving problems with right triangles, using tables, and interpolating; solution of oblique triangles using law of sines and law of cosines; graphs of the trigonnmetric functions; inverse functions, trigonometric equations. All topics are applied to practical problems.

Prerequisites: Mat 1102, Mat 1103

Psy 1101—Human Relations: A study of basic principles of human behavior. The problems of the individual are studied in relation to society, group membership, and relationships within the work situation.

Prerequisite: None

Mec 1113—Shop Processes: Study of practices used in metalworking shops: introduction to how materials can be utilized, and to the processes of shaping, forming and fabricating of metals. Demonstration of the metalworking lathes, grinders, drills, milling machines, shapers, planers, saws, broachers, gear-cutting machines and finishing machines. A study of the capabilities of these machines.

Prerequisite: None

Mec 1115—Treatment of Ferrous Metals: Investigates the properties of ferrous metals and tests to determine their uses. Instructions will include some chemical metallurgy to provide a background for the understanding of the physical changes and causes of these changes in metals. Physical metallurgy of ferrous metals, producing iron and steel, theory of alloys, shaping and forming, heat treatments for steel, surface treatments, alloy of special steel, classification of steels, and cast iron will be topics for study.

Prerequisite: None

FOURTH QUARTER

Dft 1132—Mechanical Drafting: Principles of design sketching, design drawings, layout drafting, detailing from layout drawings, production drawings and simplified drafting practices constitute areas of study. Forging and casting drawings will be made from layouts. Specifications, parts list and bill of materials are emphasized in this course. The student will develop a complete set of working drawings of a tool, jig, fixture or simple machine and learn principles of design, handbook and manual usage.
Prerequisite: Dft 1131

Mec 1114—Shop Processes: Comparison of the unit-production and mass-production systems. Casting, forging and allied processes, welding and sheet metal working processes are demonstrated and discussed. Mass-production methods are studied in relationship to precision dimensional control.
Prerequisite: Mec 1113

Mec 1116—Treatment of Non-Ferrous Metals: Continuation of the study of physical metallurgy. The non-ferrous metals; bearing metals (brass, bronze, lead), light metals (aluminum and magnesium) and copper and its alloys are studied. Powder metallurgy, titanium, zirconium, indium and vanadium are included in this course.
Prerequisite: Mec 1115

Bus 1105—Industrial Organizations: Methods, techniques, and practices of modern management in planning, organizing and controlling operations of a manufacturing concern. Introduction to the competitive system and the factors constituting product cost.
Prerequisite: None

HEATING, REFRIGERATION & AIR CONDITIONING

COURSE DESCRIPTION BY QUARTERS

Ahr 1116—Oil Burner Installation and Service: An introduction to the principle of heating, terminology, and the use and repair of equipment. Also included will be maintenance and service of heating units and diagnosing troubles within installation. Temperature and thermostat controls are also a part of this course.
Prerequisite: None

Mat 1115—Electrical Mathematics: An introductory algebra course with trigonometry and vectors needed in alternating current: algebraic operations of addition, subtraction, multiplication and division; use of letters and signs, grouping, factoring; exponents, ratios and proportions; algebraic and graphic solutions of first-degree equations; introduction to trigonometric functions, their graphs and applications to right triangles. Addition, subtraction and resolution of vector quantities.
Prerequisite: None

Phy 1101—Applied Science: An introduction to physical principles and their application in industry. Topics in this course include measurement; properties of solids, liquids, and gases; basic electrical principles.
Prerequisite: None

Dft 1104—Blueprint Reading: Interpretation and reading of blueprints. Information on the basic principles of the blueprint; lines, views, dimensioning procedures and notes.
Prerequisite: None

Ahr 1121—Principles of Refrigeration: An introduction to the principles of refrigeration, terminology, the use and care of tools and equipment, and the

identification and the function of the component parts of a system. Other topics to be included will be the basic laws of refrigeration; characteristics and comparison of the various refrigerants; the use and construction of valves, fittings, and basic controls. Practical work includes tube bending, flaring and soldering. Standard procedures and safety measures are stressed in the use of special refrigeration service equipment and the handling of refrigerants.
Prerequisite: None

SECOND QUARTER

Ahr 1117—Gas Burners, Electric Heat and Liquid Heat Applications: An introduction to the principles of heating with the use of gas, electric, or liquid heat units. The course includes installation in service to the above forms of heating units. The course will also include servicing and corrective maintenance techniques as it applies to the above three forms of heating units.
Prerequisite: None

Ahr 1122—Domestic Refrigeration: Domestic refrigeration servicing of conventional, hermetic, and absorption systems. Cabinet care, controls, and system maintenance in domestic refrigerators, freezers, and window air conditioning units is stressed. Commercial refrigeration servicing of display cabinets, walk-in cooler and freezer units, and mobile refrigeration systems is studied. The use of manufacturers' catalogs in sizing and matching system components and a study of controls, refrigerants, servicing methods is made. The American Standard Safety Code for refrigeration is studied and its principles practiced.
Prerequisite: Ahr 1121

Elec 1101—Applied Electricity: The use and care of test instruments and equipment used in servicing electrical apparatus for air conditioning and refrigeration installations. Electrical principles and procedures for trouble-shooting of the various electrical devices used in air conditioning, heating, and refrigeration equipment. Included will be transformers, various types of motors and starting devices, switches, electrical heating devices and wiring.
Prerequisite: None

Dft 1116—Applied Drafting: The teaching of fundamentals, sketching and drawing as may be found in the heating, refrigeration, and air conditioning trades. Course will include some drawings of electrical circuits, heating controls and elements, refrigeration controls, and similar drawings as may be seen on blueprints related to these trades.
Prerequisite: None

Ahr 1113—Calculation of Heat Loss: Course includes the mathematics and formulas used in the building trades for determining heat loss of any given building. Included also will be a study of building materials and their potential heat loss when used in construction. Students should at the end of this course have the ability to accurately determine the amount of heat loss of any given building in order that a proper heating unit may be installed of adequate size and capacity.
Prerequisite: None

Wld 1101—Basic Gas Welding: Welding demonstrations by the instructor and practice by students in the welding shop. Safe and correct methods of assembling and operating the welding equipment. Practice will be given for surface welding; bronze welding, silver-soldering, and flame-cutting methods applicable to mechanical repair work.
Prerequisite: None

THIRD QUARTER

Ahr 1124—Air Conditioning and Refrigeration Servicing: Emphasis is placed on the installation, maintenance, and servicing of equipment used in the cleaning, changing, humidification and temperature control of air in an air

conditioned space. Installation of various ducts and lines needed to connect various components is made. Shop work involves burner operation, controls, testing and adjusting of air conditioning and refrigeration equipment, and location and correction of equipment failure.
Prerequisite: Ahr 1122

Ahr 1106—Calculations of Heat Loads: A continuation of the study of heat loss or gains through the use of various materials in construction. Students taking this course should have the capacity to determine heat loss or gains and convert these findings for proper sizing of air conditioning heat pumps, or heating units within any given building. The mathematics, charts, and the tables will be used by the students in accurately determining the size of units for the job under construction.
Prerequisite: Ahr 1113

Elec 1102—Applied Electricity: The use and care of test instruments and equipment used in servicing electrical apparatus for air conditioning and refrigeration installations. Electrical principles and procedures for trouble-shooting of the various electrical devices used in air conditioning, heating, and refrigeration equipment. Included will be transformers, various types of motors and starting devices, switches, electrical heating devices and wiring.
Prerequisite: 1101

Ahr 1123—Principles of Air-Conditioning: Work includes the selection of various heating, cooling and ventilating systems, investigation and control of factors affecting air cleaning, movement, temperature, and humidity. Use is made of psychrometric charts in determining needs to produce optimum temperature and humidity control. Commercial air conditioning equipment is assembled and tested. Practical sizing and balancing of ductwork is performed as needed.
Prerequisite: Ahr 1122

Mat 1103—Geometry: Fundamental properties and definitions; plane and solid geometric figures, selected general theorems, geometric construction of lines, angles and plane figures. Dihedral angles, areas of plane figures, volumes of solids. Geometric principles are applied to shop operations.
Prerequisite: None

FOURTH QUARTER

Ahr 1126—All Year Comfort Systems: Auxiliary equipment used in conjunction with refrigeration systems to provide both heating and cooling for "all year" comfort will be studied and set up in the laboratory. Included will be oil fired systems, gas fired systems, water circulating systems, and electric-resistance systems. Installation of heat pumps will be studied along with servicing techniques. Reversing valves, special types of thermostatic expansion valves, systems of de-icing coils, and electric wiring and controls are included in the study.
Prerequisite: Ahr 1123 and Ahr 1124

Ahr 1109—Estimating for Refrigeration and Cooling: Estimating loads and capacity of refrigeration and cooling units through the use of manuals, tables, and charts. Students will be expected to acquire sufficient knowledge to determine and recommend the adequate sizing of refrigeration and cooling units for specific uses either in homes or industry.
Prerequisite: None

Bus 1103—Small Business Operations: An introduction to the business world, problems of small business operation, basic business law, business forms and records, financial problems, ordering and inventorying, layout of equipment and offices, methods of improving business, and employer-employee relations.
Prerequisite: None

Mec 120—Duct Construction and Maintenance: Study of various duct materials including sheet steel, aluminum, and fiber glass. Safety, sheet metal hand tools, cutting and shaping machines, fasteners and fabrication practices, layout methods, and development of duct systems. The student will service various duct systems and perform on the site repairs including ducts made of fiber glass. A study is made of duct fittings, dampers and regulators, diffusers, heater and air washers, fans, insulation and ventilating hoods.
Prerequisite: Dft 1116

MACHINIST

COURSE DESCRIPTIONS BY QUARTERS

FIRST QUARTER

Mec 1101—Machine Shop Theory and Practice: An introduction to the machinist trade and the potential it holds for craftsmen. Deals primarily with the identification, care and use of basic hand tools and precision-measuring instruments. Elementary layout procedures and processes of lathe, drill press, grinding (off-hand) and milling machines will be introduced both in theory and practice.
Prerequisite: None

Mat 1101—Fundamentals of Mathematics: Practical number theory. Analysis of basic operations: addition, subtraction, multiplication and division. Fractions, decimals, powers and roots, percentages, ratio and proportion. Plane and solid geometric figures used in industry; measurement of surfaces and volumes. Introduction to algebra used in trades. Practice in depth.
Prerequisite: None

Dft 1104—Blueprint Reading: Mechanical: Interpretation and reading of blueprints. Information on the basic principles of the blueprint; lines, views, dimensioning procedures and notes.
Prerequisite: None

Eng 1101—Reading Improvement: Designed to improve the student's ability to read rapidly and accurately. Special machines are used for class drill to broaden the span of recognition, to increase eye coordination and word group recognition and to train for comprehension in larger units.
Prerequisite: None

Phy 1101—Applied Science: An introduction to physical principles and their application in industry. Topics in this course include measurement; properties of solids, liquids, and gases; basic electrical principles.
Prerequisite: None

SECOND QUARTER

Mec 1102—Machine Shop Theory and Practice: Advances operations in layout tools and procedures, power sawing, drill press, surface grinder, milling machine shaper. The student will be introduced to the basic operations on the cylindrical grinder and will select projects encompassing all the operations, tools and procedures thus far used and those to be stressed throughout the course.
Prerequisite: Mec 1101

Mat 1103—Geometry: Fundamental properties and definitions; plane and solid geometric figures, selected general theorems, geometric construction of lines, angles and plane figures. Dihedral angles, areas of plane figures, volumes of solids. Geometric principles are applied to shop operations.
Prerequisite: None

Dft 1105—Blueprint Reading: Mechanical: Further practice in interpretation of blueprints as they are used in industry; study of prints supplied by industry; making plans of operations; introduction to drafting room procedures; sketching as a means of passing on ideas, information and processes.
Prerequisite: **Dft 1104**

Phy 1102—Applied Science: The second in a series of two courses of applied physical principles. Topics introduced in this course are heat and thermometry, and principles of force, motion, work, energy, and power.
Prerequisite: **Phy 1101**

Eng 1102—Communication Skills: Designed to promote effective communication through correct language usage in speaking and writing.
Prerequisite: **Eng 1101**

THIRD QUARTER

Mec 1103—Machine Shop Theory and Practice: Advanced work on the engine lathe, turning, boring and threading machines, grinders, milling machine and shaper. Introduction to basic indexing and terminology with additional processes on calculating, cutting and measuring of spur, helical, and worm gears and wheels. The trainee will use precision tools and measuring instruments such as vernier height gages, protractors, comparators, etc. Basic exercises will be given on the turret lathe and on the tool and cutter grinder.
Prerequisite: **Mec 1102**

Mec 1115—Treatment of Ferrous Metals: Investigates the properties of ferrous metals and tests to determine their uses. Instructions will include some chemical metallurgy to provide a background for the understanding of the physical changes and causes of these changes in metals. Physical metallurgy of ferrous metals producing iron and steel, theory of alloys, shaping and forming, heat treatments for steel, surface treatments, alloy of special steel, classification of steels, and cast iron will be topics for study.
Prerequisite: None

Dft 1106—Blueprint Reading: Mechanical: Advanced blueprint reading and sketching as related to detail and assembly drawings used in machine shops. The interpretation of drawing of complex parts and mechanisms for features of fabrication, construction and assembly.
Prerequisite: **Dft 1105**

Mat 1104—Trigonometry: Trigonometric ratios; solving problems with right triangles, using tables, and interpolating; solution of oblique triangles using law of sines and law of cosines; graphs of the trigonometric functions; inverse functions, trigonometric equations. All topics are applied to practical problems.

Prerequisite: **Mat 1103**

Psy 1101—Human Relations: A study of basic principles of human behavior. The problems of the individual are studied in relation to society, group membership, and relationships within the work situation.

Prerequisite: None

FOURTH QUARTER

Mec 1104—Machine Shop Theory and Practice: Development of class projects using previously learned procedures in planning, blueprint reading, machine operations, final assembly and inspection. Additional processes on the turret lathe, tool and cutter grinder, cylindrical and surface grinder, advanced milling machine operations, etc. Special procedures and operations, processes and equipment, observing safety procedures faithfully and establishing of good work habits and attitudes acceptable to the industry.
Prerequisites: **Mec 1103**

Mec 1116—Treatment of Non-Ferrous Metals: Continuation of the study of physical metallurgy. The non-ferrous metals: bearing metals (brass, bronze, lead), light metals (aluminum and magnesium), and copper and its alloys are studied. Powder metallurgy, titanium, zirconium, indium and vanadium are included in this course.

Prerequisite: Mec 1115

Wld 1101—Basic Gas Welding: Welding demonstrations by the instructor and practice by students in the welding shop. Safe and correct methods of assembling and operating the welding equipment. Practice will be given for surface welding, bronze welding, silver soldering, and flame-cutting methods applicable to mechanical repair work.

Prerequisite: None

Mat 1123—Machinist Mathematics: Introduces gear ratio, lead screw and indexing problems with emphasis on application to the machine shop. Practical applications and problems furnish the trainee with experience in geometric propositions and trigonometric relations to shop problems; concludes with an introduction to compound angle problems.

Prerequisite: Mat 1104

Bus 1105—Industrial Organizations: Methods, techniques, and practices of modern management in planning, organizing and controlling operations of a manufacturing concern. Introduction to the competitive system and the factors constituting product cost.

Prerequisite: None

MARINE DIESEL MECHANICS

SUGGESTED CURRICULUM BY QUARTERS

FIRST QUARTER

Mde 1101—Marine Diesel Engines Theory & Practice: Principles of main propulsion of vessels employing internal combustion engines. Construction and various designs of the operational principles of two- and four-cycle internal combustion engines, and their related piping systems, cooling, fueling and lubrication. Study of the power train componants, clutch, reduction gears, reverse gears, coupling, line shafting, and propellors. Procedures for "lighting off" operation, testing and recording engine performance, and servicing in a planned preventative maintenance program through periodic and recorded inspections. Principles of ventilation and heating of vessels, and the basic principles of steam generation where such method is employed as a medium of heating for comfort as well as providing fresh water.

Prerequisite: None

Mat 1120—Fundamentals of Mathematics: Practical number theory. Analysis of basic operations: addition, subtraction, multiplication and division. Fractions, decimals, powers and roots, percentages, ratio and proportion. Plane and solid geometric figures used in industry; measurement of surfaces and volumes. Introduction to algebra used in trades. Practice in depth.

Prerequisites: None

Phy 1104—Applied Physics I: Introductory physics and its applications. Systems of measurement, theory of matter, properties of solids, and gases.

Prerequisites: None

Mech 1121—Machine Shop Theory and Practice: An introduction to the machinist trade and the potential it holds for the craftsman. Deals primarily with the identification, care and use of basic hand tools and precision measuring instruments. Elementary layout procedures and processes of lathe, drill

press, grinding (off-hand) and milling machines will be introduced both in theory and practice.

Prerequisites: None

Eng 1101—Reading Improvement: A concentrated effort to improve the student's ability to comprehend what he reads by training him to read more rapidly and accurately. Special machines are used for class drill to broaden the span of recognition, to increase eye coordination and word group recognition, and to train for comprehension in larger units. Reading faults of the individual are analyzed for improvement, and principles of vocabulary building are stressed.

Prerequisite: None

SECOND QUARTER

Mde 1102—Marine Diesel Engines Theory and Practice: Diesel engines and related auxiliaries and their relationship to the engineering plant and their application for operating various shipboard systems. Theory of filling, storage, purification, transfer of fuels, lubricants, water, and study of the various piping systems and their maintenance. Operation of pumps for fire system, drainage, main and secondary, and of their importance in maintaining stability and trim of the vessel.

Prerequisite: Mde 101

Mat 1123—Machinist Mathematics: Fundamental geometric concepts and construction of plane and solid figures, surface and volume measurements, and related problems; introduction to the right triangle. Introduces gear ratio, lead screw and indexing problems with emphasis on application to the machine shop. Practical applications and problems furnish the trainee with experience in geometric propositions and trigonometric relations to shop problems; concludes with an introduction to compound angle problems.

Prerequisite: Ma 120

Melec 1101—Marine Electricity: Origin and history of electricity and the fundamental concepts underlying the various types of electrical marine installations. Methods of production and generation, and the study of the construction of generators and their design which are employed in the production of direct and alternating current. Practical application of acquired knowledge and methods applicable to shipboard electrical systems, namely power, lighting, and interior communications involving a variety of units which embraces the generators, switchboards, power distribution panels, transformers and cables. Methods of identifying cable markings by color code to the various power feeder systems, for the purpose of repairs and maintenance. Study of motor control equipment and its application and relation to the various systems.

Prerequisite: None

Dd 1121—Blueprint Reading: Interpretation and reading of blueprints. Development of ability to read and interpret blueprints, charts, instruction and service manuals, and wiring diagrams. Information on the basic principles of lines, views, dimensioning procedures, and notes.

Prerequisites: None

Eng 1102—Communication Skills: Development of ability to communicate effectively through the medium of good language usage in speaking and writing. Organizing thoughts, and presenting thoughts effectively in connection with problems.

Prerequisite: None

THIRD QUARTER

Mde 1103—Marine Diesel Engines Theory and Practice: Principles of operation of diesel generator plants and their application and operation in the pro-

duction of electrical power for propulsion, steerage, internal communications. deck machinery, refrigerating plants, and the production of fresh water employing the electrical vapor distilling process of evaporation.
Prerequisites: Mde 101 and 102

Melec 1102—Marine Electricity: Principles and procedures in the use of electrical indicating instruments in the control, and accurate quantitative measurement of current flow in shipboard electrical installations, including the ammeters, voltmeters, ohmeters, and electron tube analyzers. Additional techniques will be developed to conduct and record megger tests, and tactical training in the employment of the watt-meters, power factor meters, synchroscopes, and capacitance-resistance-induction bridges.
Prerequisite: Melec 101

Mech 1112—Welding: Welding demonstrations by the instructor and practice by students in the welding shop. Safe and correct methods of assembling and operating the welding equipment. Practice will be given for surface welding, bronze welding, silver soldering, and flame cutting methods applicable to mechanical repair work.
Prerequisite: None

Ss 1101—Safety at Sea: Consists not only of medical first aid, but also various life-saving drills held aboard ship, ie. life-boat drill, fire-fighting drills, man overboard, etc. The fundamentals of anatomy and physiology are covered to enable the students to understand medical first aid basics such as compression points for the application of tourniquets for stopping the flow of blood. A comprehensive sudy of the symptoms and treatment of diseases are discussed. How to tend and nurse patients at sea, how to maintain a ship's hospital, and an understanding of the use of all the first aid equipment carried in the ship's medicine locker. Methods used to attain a high degree of ship sanitation. This includes handling of food, preparation of food, storage of food, upkeep of toilets and living quarters, disposal of garbage and other wastes, and control of vermin and other disease-carrying pests. The importance of excellent standards of personal hygiene aboard ship. A practical study of various resuscitation equipment, oxygen-breathing apparatus, smoke masks, safety slings and stretchers.
The rigging and use of the breeches buoy. Life boat, life raft equipment and its use. Understanding of storm signals, distress signals and what to do to make the ship seaworthy in order to weather a severe storm. Fire hazards and fire prevention, safety rules working around machinery, general rules and regulations as prescribed by the United States Bureau of Customs, the U.S. Immigration Laws and the U.S. Coast Guard.
Prerequisite: None

Psy 1101—Human Relations: Development of understanding of relationships to other persons through some of the basic principles of human psychology. The problems of the individual and his work situation are studied in relation to the established organization of modern business and industry and in relation to government practices and labor organization, with special emphasis on the operating responsibilities of good management.
Prerequisite: None

FOURTH QUARTER

Mde 1104—Marine Diesel Engines Theory and Practice: The administration of Marine Engineering plants, through the recording and filing of performance data. Processing recording and storage of parts for the preventative maintenance program, and periodic inspections of machinery and component parts through the use of precision tools to determine conditions due to wear, and the replacement of such components in conformance with recommended standards set forth by the manufacturer.
Prerequisites: Mde 101, 102 and 103

Melec 1103—Marine Electricity: Electrical terms and formulas, and identification of various systems in shipboard operations, degaussing system, sonar system, loran system and alarm systems, and the methods of trouble shooting, prevention of electrical shock, fire and harmful gases which may be use of portable electrical equipment, and the use of chemicals and equipment when repairing and maintaining shipboard electrical installations.

Prerequisites: Melec 101 and 102

Mech 1121—Machine Shop Theory and Practice: An introduction to the machinist trade and the potential it holds for the craftsman. Deals primarily with the identification, care and use of basic hand tools and precision measuring instruments. Elementary layout procedures and processes of lathe, drill press, grinding (off-hand) and milling machines will be introduced both in theory and practice.

Prerequisite: None

Bus 1105—Industrial Organization: Methods, techniques, and practices of modern management in planning, organizing and controlling operations of a manufacturing concern. Introduction to the competitive system and the factors constituting product cost.

Prerequisite: None

OPERATING ROOM TECHNICIANS

FIRST QUARTER

Ora 1101—Operating Room Assistant I: Basic Anatomy and Physiology of the human body, which consist of the nerves, muscles, bones, blood vessels and the different systems of the body. Basic Microbiology which consists of the many different microorganisms or "germs" and how they effect our body. Ethics and communications will be taught in this quarter.

Lab.—Some introduction into the Operating Room in observing the actual working of this area.

SECOND QUARTER

Ora 1102—Operating Room Assistant II: Operating Room technique as related to actual practice scrubbing and setting up for operations. Learning the instruments and packs, how they are set-up and autoclaved or sterilized. Scrubbing in with a nurse and assisting with operations. Learning the basic principles of Sterile Technique as a Scrubbed Assistant or a Circulating Assistant. Ethics and communication skills will continue in this quarter.

Lab.—In the Operating Rooms and Central Sterile Service.

PRACTICAL NURSE EDUCATION

PRACTICAL NURSING I

OBJECTIVES: To assist beginning students in practical nursing to acquire basic knowledge from nursing and from related areas of learning and to begin to develop the skills needed for safe and effective bedside care of patients whose health deviation has created a state of dependency in matters of daily living.

Course Material:

Nursing — History; introduction to patient care.

Health — Personal, physical and mental; family; community.

Basic Science — Body structure and function; bacteriology; basic nutrition.

Vocational Adjustments — Introduction to ethics and legal aspects of nursing.

Communications and Human Relations.

Classroom activities are planned to assist students in development of knowledge, understanding, appreciations, and attitudes basic to effective nursing of patients of all ages and backgrounds with nursing needs arising both from the individuality of the patient and from inability for self-care as a result of a health deviation. The student is encouraged to develop beginning skills in analysis of patient needs, both through classroom study of hypothetical patient situations and through planned patient experiences in the clinical environment. Beginning skills in nursing methods are developed through planned laboratory experiences, followed by related practice in actual patient care.

Clinical activities provide introduction to actual patient care through selected clinical assignments requiring application of current classroom and laboratory learnings.

Prerequisite: Admission requirements

PRACTICAL NURSING II

OBJECTIVES: To assist practical nursing students to acquire further knowledge and understanding and to develop further skills needed for rendering safe and effective nursing care to patients of all ages.

Course Material:

Medical-Surgical Nursing — Patient care; therapeutic methods, including administration of oral medication.

Introduction to Maternity Nursing.

Introduction to Nursing the Sick Child

Communications and Human Relations

Classroom activities center around analysis of nursing needs as viewed in perspective with the needs arising from the individuality of the patient and from the illness condition. Related information is presented as it is relevant to the student's understanding of and ability to meet nursing needs of patients.

Clinical activities provide selected experiences in patient care in order for the student to develop skill in applying classroom learnings to a variety of patient situations.

Prerequisite: Practical Nursing I

PRACTICAL NURSING III

OBJECTIVES: To assist practical nursing students to acquire knowledge of common disease conditions and to develop beginning skills in rendering safe and effective nursing care to patients of all ages with specific needs arising from the illness and/or therapy.

Course Material:

Common Medical-Surgical Conditions.

Care of the Subacutely-Ill Child.

Care of Maternity Patient and Newborn Infant with Complications.

Classroom activities center around analysis of nursing needs arising from the specific illness condition and the medical plan.

Clinical activities consist of guided experiences in nursing patients wth conditions which illustrate classroom learnings.

Prerequisite: Practical Nursing II

PRACTICAL NURSING IV

OBJECTIVES: To assist advanced practical nursing students to acquire knowledge of needs of patients who are seriously ill, to develop beginning skills in assisting the registered nurse and/or physician in complex nursing situations, and to make the transition to the role of graduate practical nurse.

Course Material:

Needs of the Seriously-Ill Patient.
Needs of Patients in Immediate Post-Operative Period.
Needs of the Labor Patient
Needs of the Seriously-Ill Child.
Assuming the Role of Graduate Practical Nurse.

Classroom activities center around the needs of seriously-ill patients of all ages, of labor patients, and of patients immediately following surgery.

Clinical activities consist of guided experiences in the care of seriously-ill patients, labor patients, and surgery patients, and is planned to parallel classroom learnings whenever possible.

Prerequisite: Practical Nursing III

RADIO AND TELEVISION SERVICING

COURSE DESCRIPTIONS BY QUARTERS

FIRST QUARTER

Mat 1115—Electrical Mathematics: An introductory algebra course with trigonometry and vectors needed in alternating current: algebraic operations of addition, subtraction, multiplication and division; use of letters and signs, grouping, factoring; exponents, ratios and proportions; algebraic and graphic solutions of first-degree equations; introduction to trigonometric functions, their graphs and applications to right triangles. Addition, subtraction and resolution of vector quantities.

Prerequisite: None

Eng 1101—Reading Improvement: Designed to improve the student's ability to read rapidly and accurately. Special machines are used for class drill to broaden the span of recognition, to increase eye coordination and word group recognition and to train for comprehension in larger units.

Prerequisite: None

Elc 1112—Direct and Alternating Current: A study of the structure of matter and the electron theory, the relationship beween voltage, current and resistance in series, parallel and series-parallel circuits. Analysis of direct current circuits by Ohm's law and Kirchhoff's law; sources of direct current potentials. Fundamental concepts of alternating current flow; a study of reactance, impedance, phase angle, power and resonance and alternating current circuit analysis.

Prerequisite: None

SECOND QUARTER

Mat 1116—Electrical Mathematics: A working knowledge of the powers of 10, Ohm's law for series and parallel circuits, quadratic equations, Kirchhoff's laws, trigonometric functions, plane vectors, alternating currents, vector algebra and logarithms.

Prerequisite: Mat 1115

Eng 1102—Communication Skills: Designed to promote effective communication through correct language usage in speaking and writing.
Prerequisite: Eng 1101

Eln 1122—Vacuum Tubes and Circuits: An introduction to vacuum tubes and their development; the theory, characteristics and operation of vacuum diodes, semi-conductor diodes, rectifier circuits, filter circuits, triodes and simple voltage amplifier circuits.
Prerequisites: Elc 1112, Mat 1115

Eln 1123—Amplifier Systems: An introduction of commonly used servicing techniques as applied to monophonic and stereophonic high-fidelity amplifier systems and auxiliary equipment. The operation and servicing of inter-communication amplifiers and switching circuits will also be taught.
Prerequisites: Mat 1115, Elc 1112

THIRD QUARTER

Eln 1125—Radio Receiver Servicing: Principles of radio reception and practices of servicing; included are block diagrams of radio receivers, servicing techniques of AM and FM receivers by resistance measurements, signal injection, voltage analysis, oscilloscope methods of locating faulty stages and components and the alignment of AM and FM receivers.
Prerequisites: Eln 1123, Eln 1122

Eln 1126—Transistor Theory and Circuits: Transistor theory, operation, characteristics and their application to audio and radio frequency amplifier and oscillator circuits.
Prerequisite: Eln 1123

Psy 1101—Human Relations: A study of basic principles of human behavior. The problems of the individual are studied in relation to society, group membership, and relationships within the work situation.
Prerequisite: None

FOURTH QUARTER

Eln 1127—Television Receiver Circuits and Servicing: A study of principles of television receivers, alignment of radio and intermediate frequency amplifiers, adjustment of horizontal and vertical sweep circuits will be taught. Techniques of troubleshooting and repair of TV receivers with the proper use of associated test equipment will be stressed. Additional study of more specialized servicing techniques and oscilloscope waveform analysis will be used in the adjustment, troubleshooting and repair of the color television circuits.
Prerequisites: Eln 1126, Eln 1125

Bus 1103—Small Business Operations: An introduction to the business world, problems of small business operation, basic business law, business forms and records, financial problems, ordering and inventorying, layout of equipment and offices, methods of improving business, and employer-employee relations.
Prerequisite: None

ELECTIVES

Eln 1129—Single Side-band Systems: An introductory course of single side-band transmission system with carrier frequency or without and the associated

balanced modulator of phasing system used to produce this type of transmission. Time will be allotted also to the necessary circuitry in the receiver to receive this type of transmission.
Prerequisites: Eln 1126, Eln 1125

Eln 1130—Two-way Mobile Maintenance: A course to acquaint the student with the theory and maintenance of fixed station and mobile station transmitters and receivers. Except for radio laws, sufficient information will be given to qualify the student to take the FCC second-class radiotelephone license examination.
Prerequisites: Eln 1126, Eln 1125

WELDING

COURSE DESCRIPTIONS BY QUARTERS

FIRST QUARTER

Wld 1120—Oxacetylene Welding and Cutting: Introduction to the history of oxyacetylene welding, the principles of welding and cutting, nomenclature of the equipment, assembly of units. Welding procedures such as practice of puddling and carrying the puddle, running flat beads, butt welding in the flat, vertical and overhead position, brazing, hard and soft soldering. Safety procedures are stressed throughout the program of instruction in the use of tools and equipment. Students perform mechanical testing and inspection to determine quality of the welds.
Prerequisite: None

Mat 1101—Fundamentals of Mathematics: Practical number theory. Analysis of basic operations: addition, subtraction, multiplication and division. Fractions, decimals, powers and roots, percentages, ratio and proportion. Plane and solid geometric figures used in industry; measurement of surfaces and volumes. Introduction to algebra used in trades. Practice in depth.
Prerequisite: None

Dft 1104—Blueprint Reading: Mechanical: Interpretation and reading of blueprints. Information on the basic principles of the blueprint; lines, views, dimensioning procedures and notes.
Prerequisite: None

Phy 1101—Applied Science: An introduction to physical principles and their application in industry. Topics in this course include measurement; properties of solids, liquids, and gases; basic electrical principles.
Prerequisite: None

SECOND QUARTER

Wld 1121—Arc Welding: The operation of AC transformers and DC motor generator arc welding sets. Studies are made of welding heats, polarities, and electrodes for use in joining various metal alloys by the arc welding process. After the student is capable of running beads, butt and fillet welds in all positions are made and tested in order that the student may detect his weaknesses in welding. Safety procedures are emphasized throughout the course in the use of tools and equipment.
Prerequisite: None

Mat 1103—Geometry: Fundamental properties and definitions; plane and solid geometric figures, selected general theorems, geometric construction of lines, angles and plane figures. Dihedral angles, areas of plane figures, volumes of solids. Geometric principles are applied to shop operations.
Prerequisite: None

Dft 1117—Blueprint Reading: Welding: A thorough study of trade drawings in which welding procedures are indicated. Interpretation, use and application of welding symbols, abbreviations, and specifications.

Prerequisite: Dft 1104

Phy 1102—Applied Science: The second in a series of two courses of applied physical principles. Topics introduced in this course are heat and thermometry, and principles of force, motion, work, energy, and power.

Prerequisite: Phy 1101

Eng 1102—Communication Skills: Designed to promote effective communication through correct language usage in speaking and writing.

Prerequisite: Eng 1101

THIRD QUARTER

Wld 1124—Pipe Welding: Designed to provide practice in the welding of pressure piping in the horizontal, vertical, and horizontal-fixed position using shielded metal arc welding processes according to Sections VIII and IX of the ASME code.

Prerequisite: Wld 1121

Wld 1123—Inert Gas Welding: Introduction and practical operations in the use of inert-gas-shield arc welding. A study will be made of the equipment, operation, safety and practice in the various positions. A thorough study of such topics as: principles of operation, shielding gases, filler rods, process variations and applications, manual and automatic welding.

Prerequisites: Wld 1120, Wld 1121

Wld 1112—Mechanical Testing and Inspection: The standard metrods for mechanical testing of welds. The student is introduced to the various types of tests and testing procedures and performs the details of the test which will give adequate information as to the quality of the weld. Types of tests to be covered are: bend, destructive, free-bend, nick-tear, notched-bend, tee-bend, nondestructive, V-notch, Charpy impact, etc.

Prerequisites: Wld 1120, Wld 1121

Dft 1118—Pattern Development and Sketching: Continued study of welding symbols; methods used in layout of sheet steel; sketching of projects, jigs and holding devices involved in welding. Special emphasis is placed on developing pipe and angle layouts by the use of patterns and templates.

Prerequisite: None

Psy 1101—Human Relations: A study of basic principles of human behavior. The problems of the individual are studied in relation to society, group membership, and relationships within the work situation.

Prerequisite: None

FOURTH QUARTER

Wld 1122—Commercial and Industrial Practices: Designed to build skills through practices in simulated industrial processes and techniques: sketching and laying out on paper the size and shape description, listing the procedure steps necessary to build the product, and then actually following these directions to build the product. Emphasis is placed on maintenance, repairing worn or broken parts by special welding applications, field welding and nondestructive tests and inspection.

Prerequisites: Wld 1120, Wld 1121

Wld 1125—Certification Practices: This course involves practice in welding the various materials to meet certification standards. The student uses various tests including the guided bend and the tensile strength tests to check the quality of his work. Emphasis is placed on attaining skill in producing quality welds.

Prerequisites: Wld 1120, Wld 1121, Wld 1123, Wld 1124

Mec 1112—Machine Shop Processes: To acquaint the student with the procedures of layout work and the correct use of hand and machine tools. Experiences in the basic fundamentals of drill press and lathe operation; hand grinding of drill bits and lathe tools; set-up work applied to the trade.

Prerequisite: None

Bus 1105—Industrial Organizations: Methods, techniques, and practices of modern management in planning, organizing and controlling operations of a manufacturing concern. Introduction to the competitive system and the factors constituting product cost.

Prerequisie: None

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